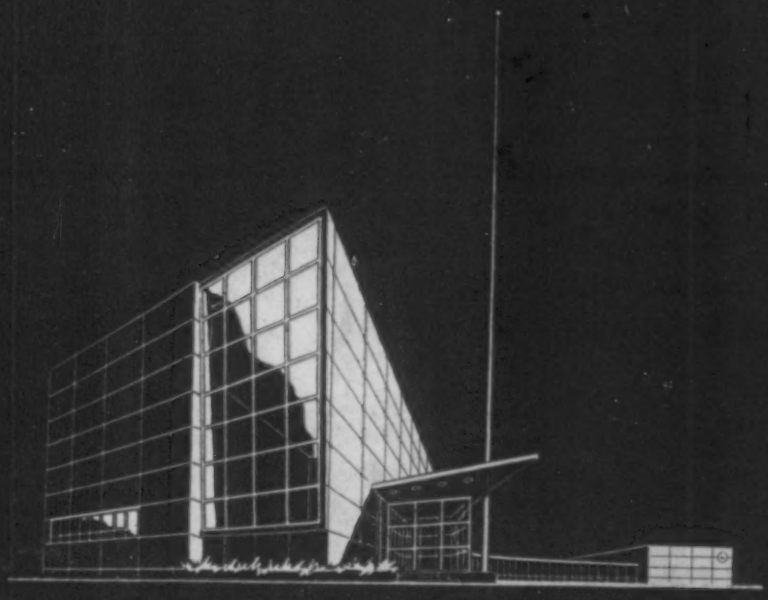
ARCHITECTURAL RECORD

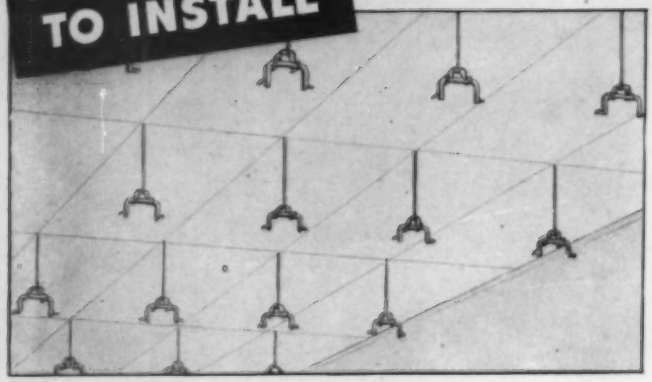


INDUSTRIAL BUILDINGS • NOVEMBER 1945

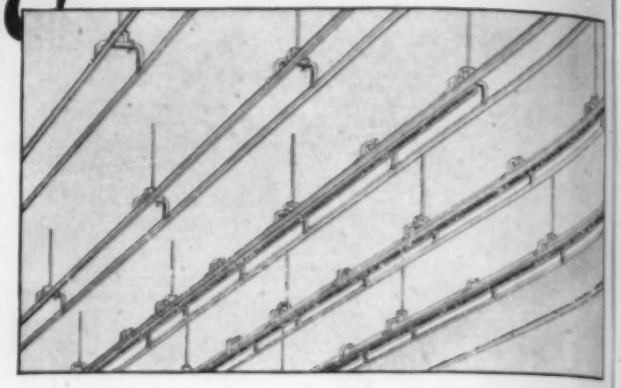
VICTORY LOAN

IT'S JUST THIS SIMPLE TO INSTALL

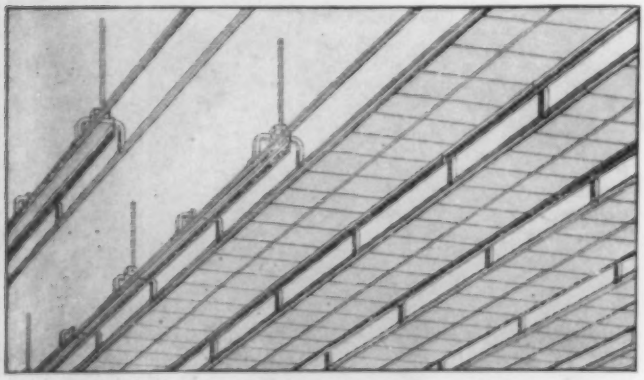
Ceilings Unlimited



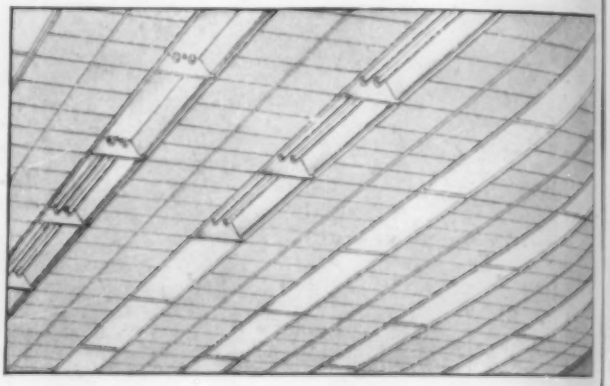
1. Suspend patented Miller Ceiling Furring Hangers from structural ceiling by rods. (The Miller System requires but half the usual number of supports... economy, plus more space above furred ceiling for air conditioning ducts, piping, etc.)



2. Suspend Furring of any type from the hangers. (Hangers are equipped with furring attachment devices to support furring of acoustic tile, metal lath and plaster and other ceiling materials. They are adjustable for leveling finished ceiling.)



3. Mount wiring channel and reflectors inside the hangers, install finished ceiling tile. (The continuous wireway channel and other Miller engineering features cut wiring costs up to 50%, conduit and conduit installation costs up to 80% —as well as many other really startling economies.)



4. Attach hinged doors to reflectors, swing them into place, lock—and that's that. (It really *is* "that's that" for Miller Fluorescent Troffer Lighting Systems are designed to solve old furring problems—without creating any *new* ones.)

Miller Fluorescent Troffer Lighting Systems

for stores, schools, offices and public buildings

The 8-foot, 4-foot or 2-foot Troffer sections may be easily combined to form innumerable patterns of practically any dimension (of two-lamp type with removable hinged doors or single-lamp ALZAK aluminum type with louvre shielding).

This versatility provides the architect with practicable instruments of expression. It is now *engineeringly* (as well as esthetically) sound to plan entire buildings—*around the lighting.*

All this is but part of the fascinating story of Miller Fluorescent Troffer Lighting Systems. The whole story is told in "CEILINGS UNLIMITED", a big new brochure—catalogue, complete with photographs, architects' renderings, working drawings and specifications.

Miller engineers, located in principal cities, will be glad to provide you with a copy—or you may write directly to The Miller Company.

THE MILLER COMPANY • MERIDEN, CONNECTICUT

ILLUMINATING DIVISION
Fluorescent, Incandescent
Mercury Lighting Equipment

HEATING PRODUCTS DIVISION
Domestic Oil Burners
and Liquid Fuel Devices

ROLLING MILL DIVISION
Phosphor Bronze and Brass
in Sheets, Strips and Rolls

WAR CONTRACTS DIVISION
War Materiel

FOUNDRY DIVISION
Non-Ferrous Metal Castings

MILLER
SINCE 1844

ARCHITECTURAL RECORD (Vol. 98, No. 5, November 1945) is published monthly by F. W. Dodge Corp., 34 No. Crystal St., East Stroudsburg, Pa., with editorial and executive offices at 119 W. 40th St., New York 18, N. Y. $3 per year; Foreign, $5. Entered as second class matter, May 27, 1942, at the Post Office, East Stroudsburg, Pa., under the Act of March 3, 1879.

ARCHITECTURAL

VOL. 98 • NO. 5 NOVEMBER • 1945

RECORD

COMBINED WITH AMERICAN ARCHITECT AND ARCHITECTURE

ARCHITECTS SPEED RE-EMPLOYMENT ... 79
A Radio Message from the Editors of ARCHITECTURAL RECORD

SETTING THE STANDARDS ... 81
An Editorial . . . by Kenneth K. Stowell

FIRESTONE RESEARCH LABORATORY ... 82
Laboratory Building for Firestone Tire & Rubber Co., Akron, Ohio. Voorhees, Walker, Foley & Smith, Architects and Engineers

GENERAL MOTORS TECHNICAL CENTER ... 98
Saarinen and Swanson, Architects; Thomas Church, Landscape Architect

RESEARCH LABORATORY FOR HOFFMAN-LA ROCHE, INC. 104
Nutley, N. J. Fellheimer and Wagner, Architects

RESEARCH AND MANUFACTURE COMBINED UNDER ONE ROOF ... 112
Johns-Manville Corp. Research Center, near Bound Brook, N. J. Shreve, Lamb and Harmon, Architects

UNIVERSITY LAB ... 114
Georgia School of Technology, Atlanta, Ga. Bush-Brown & Gailey, Architects. P. M. Heffernan, Associate

INDUSTRIAL GROUP ON THE CAMPUS PLAN ... 116
"Electronics Park" for General Electric Co., Syracuse, N. Y. Giffels & Vallet, Inc., L. Rossetti, Associated Engineers and Architects

BUILDING TYPES STUDY No. 107 . . *FACTORY DESIGN FOR LOW-COST PRODUCTION* ... 118

THE DESIGN OF FACTORIES TODAY ... 120
Review and Forecast by Members of Albert Kahn Associated Architects and Engineers, Inc.

NEW IDEAS IN INDUSTRIAL RESTAURANT DESIGN ... 139
By Arthur W. Dana

TIME-SAVER STANDARDS . . . Laboratory Service Piping ... 143

THE RECORD REPORTS . . . News from the Field ... 7

FOR BETTER BUILDING ... 20
News of Materials, Equipment and Methods

MANUFACTURERS' LITERATURE ... 24

REQUIRED READING ... 28

INDEX TO ADVERTISEMENTS ... 244

H. JUDD PAYNE, Vice-President in charge of Magazine Division • Copyright 1945 with all rights reserved F. W. DODGE CORPORATION

EDITOR-IN-CHIEF, Kenneth Kingsley Stowell, A.I.A.; Managing Editor, Emerson Goble; Associate Editor, Douglas Haskell; Associate in South America, Edmund J. Whiting, A.I.A.; Desk Editor, Florence A. van Wyck; Art Director, W. K. Allen. CONSULTANTS: Industry Relations Consultant: Thomas S. Holden. Statistical Consultant: Clyde Shute. Building Economics Consultant: Norbert Brown. Field Research Consultant: Clifford Dunnells, Jr.

Architectural Record (combined with American Architect and Architecture) is published monthly by F. W. Dodge Corporation, 34 No. Crystal St., East Stroudsburg, Pa., with Editorial and Executive Offices at 119 West 40th Street, New York, N. Y. Thomas S. Holden, Pres.; Howard J. Barringer, Vice-Pres. and Treas.; Irving W. Hadsell, Vice-Pres.; Chauncey L. Williams, Vice-Pres.; Sanford D. Stockton, Jr., Secy.; Walter F. De Saix, Asst. Treas.; Edwin H. Fred, Asst. Treas. Member Audit Bureau of Circulation and Associated Business Papers, Inc. Architectural Record is indexed in Reader's Guide, Art Index and Industrial Arts Index. Subscription rates: United States and Possessions, Canada, Cuba, Mexico, Central and South America, $3 the year, $5 for two years, $6 for three years; elsewhere, $5 the year; single copy, $1. Circulation Manager: Marshall Ginn. Every effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage. Other Dodge Services: Real Estate Record & Builders' Guide, Sweet's Files, Home Owners' Catalog, Dodge Reports & Dodge Statistical Research Service.

Flush Valve Application Data

INDUSTRIAL PLANTS

Compiled by the manufacturers of Watrous Flush Valves

Architects Indicate Preferences in Poll on Flush Valves for Industrial Plants

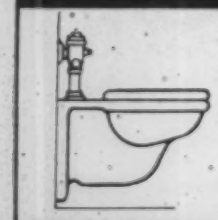
To obtain a reliable answer to the question, "What are the most suitable types of flush valves for industrial plants?", Watrous recently sent a special ballot sheet to a list of architects. Replies came from architects who do a tremendous amount of industrial plant designing.

This study, we believe, will be of considerable value in connection with present planning. If you have any further thoughts on this subject, we shall be pleased to hear from you and to add your selections to the results summarized below.

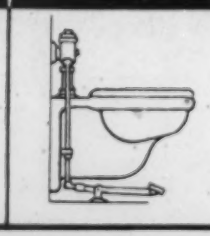
Flush Valve Combinations for Closet Bowls

Votes were cast on the question: "Which combinations do you believe offer the most advantages for use in postwar industrial plants?"

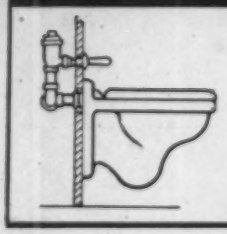
1st choice LOW TOP SPUD Preferred by 27%



2nd choice FOOT-LEVER TYPE Preferred by 20%



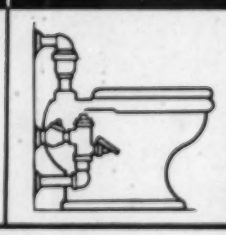
3rd choice CONCEALED Preferred by 16%



4th choice HIGH TOP SPUD Preferred by 14%

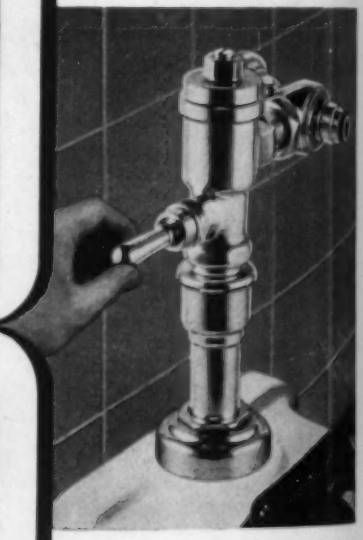
5th choice SEAT ACTION Preferred by 13%

6th choice FOOT-OPERATED Preferred by 10%



Choice on Silent-Action Combinations

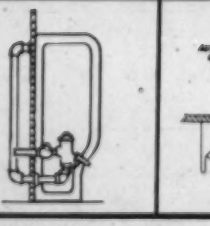
Results show that **88%** of architects agreed that office washrooms should have "silent-action" flush valves . . . while conversely **91%** voted for the "regular" flush valves for factory washrooms.



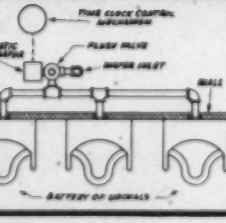
Flush Valve Combinations for Urinals

1st choice EXPOSED Preferred by 30%

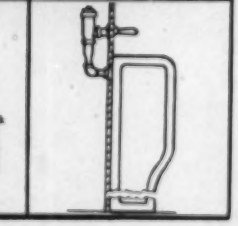
2nd choice FOOT-OPERATED Preferred by 29%



3rd choice AUTOMATIC OPERATION Preferred by 27%



4th choice CONCEALED Preferred by 14%



For complete information on Watrous Flush Valves see Sweet's Catalog or write for Catalog No. 448-A.

THE IMPERIAL BRASS MFG. COMPANY, 1240 West Harrison Street, Chicago 7, Illinois

Watrous Flush Valves

THE RECORD REPORTS

OPA Plans to Continue Controls • Construction Division of Commerce Department Gets Under Way • Congress Offers Building Suggestions • Public Works Bill Is Introduced

As Washington sloughs off wartime controls and agencies, fattens old-line bureaus for postwar chores, and generally conditions itself for transition, it is clearing the way—with special fanfare—for the construction industry.

Because of its concern for jobs, its desire to transform the nation's machinery swiftly into full-scale peacetime operation, and its knowledge that building "can be the greatest single additional source of jobs in our entire economy," it not only has snipped off all reins on construction but also is attuning the remaining controls to speed supplies of scarce building materials, prevent hoarding of inventories, and check runaway prices.

"Nothing must stop home or commercial construction"—in effect, these are the government's words. Reconversion Mogul John W. Snyder, in his September announcement broke down the idea into six sharp points, going even so far as to say that "if necessary, price and wage increases and priorities to break bottlenecks will be granted."

OPA Maps Skirmishes

The sudden jump from a heavy harness of regulatory hobbles to a free-for-all race of production has thrown confusion into circles all down the line, not the least among the federal agencies themselves. As the War Production Board folds its tents to "steal away" into the dusty pages of history, the biggest array of questions buzzes about the head of Chester Bowles and his beleaguered Office of Price Administration.

But OPA Chief Bowles has his skirmishes mapped to meet, in his words, "a highly explosive situation in the whole field of home building, home ownership, and rent control." Bluntly he states his objective:

"We intend vigorously to carry out our program to protect home owners and the building industry itself from the inflationary boom which some irresponsible people seem to be sponsoring."

Price Controls to Continue

His program:

1. Tightened control over building material prices, over most fixtures and household equipment which goes into a new home and construction services.

2. All-out enforcement of the necessary regulations.

3. Control over the price of completed homes.

4. Release of rent controls in any rental area "only when the danger of a general increase in that area has been eliminated."

It should be noted that OPA's controls over building materials and services will vary from area to area, covering lumber, insulation, brick, soil pipe, millwork items (such as doors, windows and cabinets, bathtubs, septic tanks, wash basins, painting and papering, renewing roofs, installing plumbing, digging cellars—even margins which contractors can add to the costs of a job. Take notice, however, that OPA is granting price increases on numerous building items, among them brick, tile, lath, radiators, pine lumber, cement, cast iron soil pipe and fittings, scaling and grading of logs in the Pacific Northwest.

WPB Has Last Fling

Among its last flings at steering national production, the WPB freed lumber as of October 1 and all construction activity as of the following fortnight. Prodigious military cutbacks made the former possible; postwar needs required the latter so that the "pipe-line" industries (between the manufacturer and the consumer) could get their shelves at least partially filled.

The official eye was looking toward spring: "The lead factor in most construction is about four months . . . We feel that production of construction materials will increase substantially during the months just ahead. . . . The manufacturers of building materials must be impressed with the necessity for spreading the short supply thinly across the wholesaler-retailer field so as to keep inventories down to a minimum."

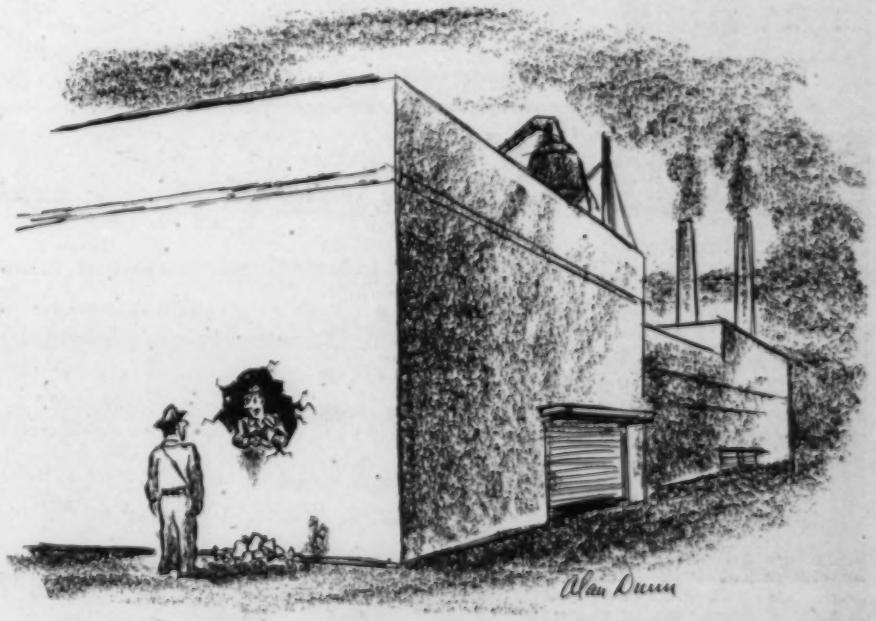
Before its final tapering down, WP let it be known that applications for priority assistance in construction in principal industries in the months since last March had scooted neatly beyond the half-billion-dollar mark.

Credit is Problem

Besides production and prices, federal worries encompass the ramifications of credit for housing. Joining hand in hand with WPB, the Federal Reserve Board, as of October 15, untied its "buying-on-time" regulation insofar as it applied to home repair and improvements. OPA wasn't too eager about this, since it fears the inflationary possibilities of the general removal of credit reins.

However, the big credit worry reaches beyond the mere matter of repairs. Snyder has said: "The federal credit agencies will do everything possible to discourage excessive and unsound lending on mortgages. They will enlist voluntary cooperation of banks and other lending institutions

(Continued on page 10)



"These windowless factories give me claustrophobia . . ."

—Drawn for the RECORD by Alan Dunn

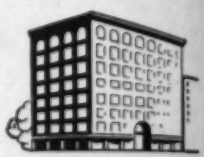
The WHERE, WHAT and WHY of Multi-Purpose Millerite Industrial Flooring

where

MILLERITE IS APPLICABLE

OFFICE BUILDINGS

FACTORIES



DEPARTMENT STORES

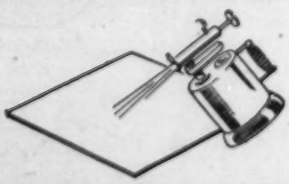
WAREHOUSES

HOSPITALS

PUBLIC BUILDINGS OF ALL KINDS

what

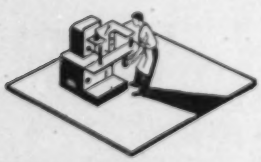
MILLERITE'S ADVANTAGES ARE



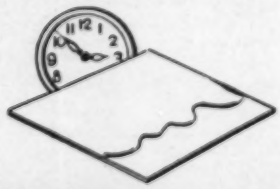
FIRE-RESISTANT • SPARKPROOF • NON-CONDUCTIVE

DURABLE • LOW COEFFICIENT OF EXPANSION

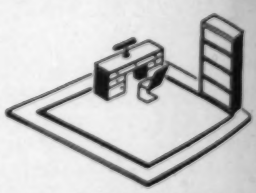
EASILY CLEANED • DUSTPROOF



NON-SKID AROUND MACHINES



AFTER APPLICATION READY FOR USE IN 18 HOURS



ATTRACTIVE • SANITARY

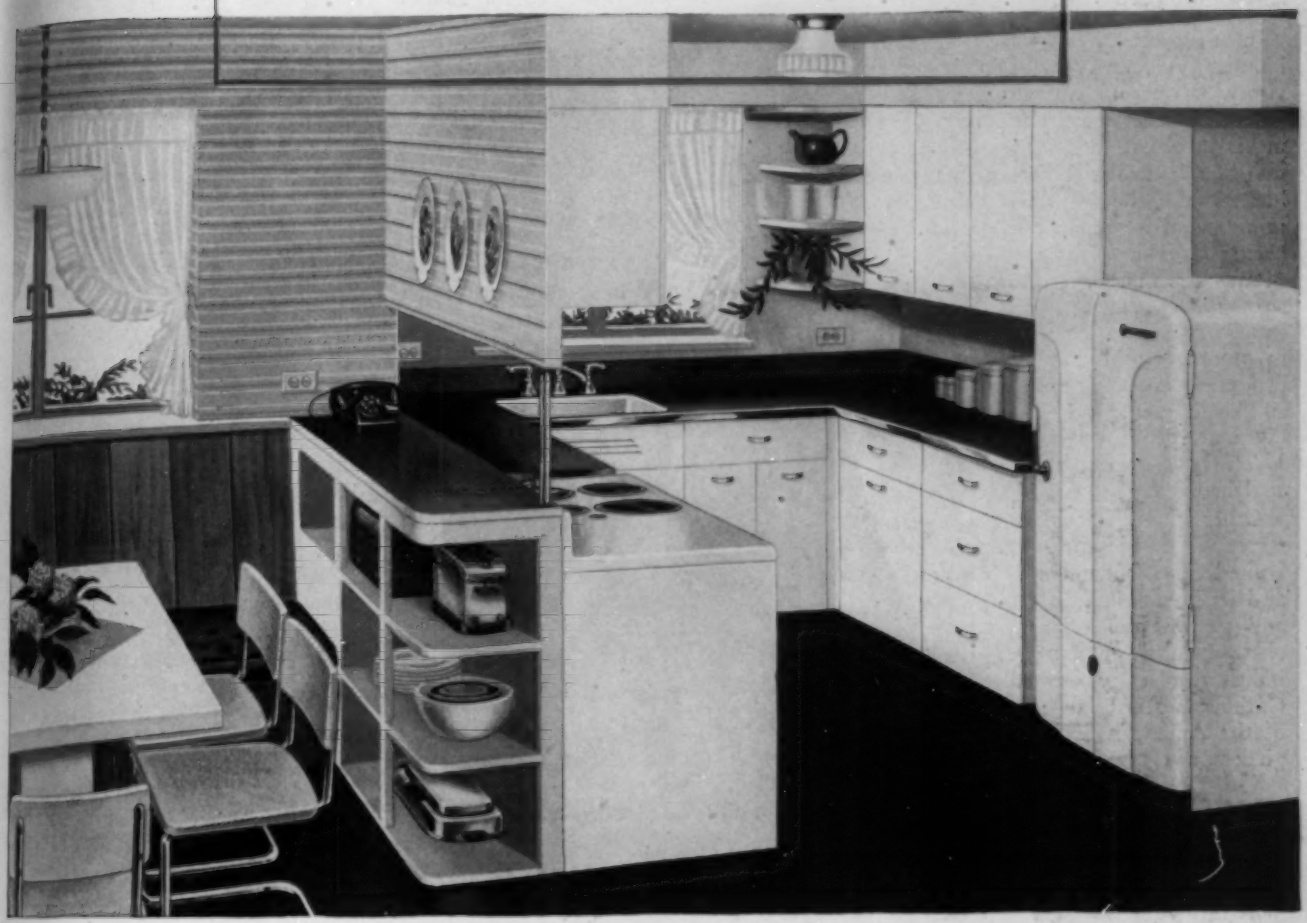
why

YOU MAY SPECIFY MILLERITE WITH CONFIDENCE

Our quarter century experience in oxychloride decking and flooring for maritime and industrial use enables us to make installations with unsurpassed speed and skill. Our coast-to-coast facilities and financial reliability are at your service. Write for new, illustrated brochure "Industrial Flooring and Marine Decking" which presents technical details and other essential information.

MILLER-MARINE DECKING CO • 230 Park Avenue • New York 17, N.Y.

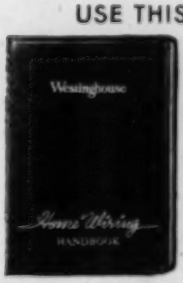
WHAT PEOPLE REALLY WANT IS *Electrical Living*



THIS KITCHEN FOR THRIFTY FAMILIES WILL WIN NEW BUSINESS

You can include the appeal of all-electric kitchens in low-cost homes, too. Not as much electrical equipment, of course, as in higher priced homes. But enough to meet the minimum requirements for standards of Electrical Living. The kitchen shown has been carefully planned to include the correct equipment for thrifty families. All houses you design and build can be planned to capitalize on the strong appeal of Electrical Living.

USE THIS BOOK TO HELP WIN APPROVAL OF EVERY ROOM



This handbook clearly presents wiring information required to analyze electrical needs, and to design and specify for them correctly. It contains everything you need to know about electric wiring for modern Electrical Living. Prepared to help architects, builders, contractors, designers and prefabricators. Costs one dollar. Send your dollar to Westinghouse Electric Corp., Industrial Relations Department, 306 Fourth Ave., Pittsburgh 30, Pa. J-91533

Westinghouse

Better Homes Department

as a part of its consulting service, offers you the following FREE books: Electrical Living in 194X—Professional Edition; Manual of Better Home Wiring; and Better Living Means Electrical Living.

 (Continued from page 7)

to minimize the danger of inflated prices due to excessive demand."

NHA is Active

In this connection, the National Housing Agency is providing an advisory service on home values even where no federal assistance in financing is involved.

Aside from the NHA activity on home values, the Federal Housing Administration is prepared to aid in preparing site plans for residential subdivisions. This includes a study of street and lot layouts, drainage, utility installations, and the like, which has to precede actual development of the project. As the fall months took over, FHA advised that 114 proposed subdivisions, providing building sites for 15,927 new homes, already had been analyzed.

Other factors among the aids to construction include the activities of the United States Chamber of Commerce and its invitation to 87 national trade and professional organizations to become members of a new construction industry advisory council with John C. Stevens of Portland, Ore., president of the American Society of Civil Engineers, as chairman.

Commerce Department Charts Aids

The Department of Commerce began throwing its new Construction Division into full gear with the naming of John L. Haynes as its chief. Mr. Haynes came to the unit from WPB, where he served as director of the Construction Bureau.

First aim of the new Commerce Division will be to assemble statistical data to help builders in planning stockpiles, says its first chief. Later on it plans to swing more into forecasts. Further expansion, which may await new Congressional appropriations is designed to include educational work on building codes and a possible conference of mayors to obtain a statement of principles in favor of certain codes with the purpose of reducing costs.

The CD's Construction Division already has ushered in a new monthly industry report for general distribution which gives a summary of current activity in construction and data on construction materials. Its first number reported an increase in construction costs and an upward movement in building materials prices. It made note, too, of the Department's survey of planned capital outlays by manufacturers, which disclosed 7,000 manufacturers planning to spend $4.5 billion for plant, equipment and alterations in the postwar period.

Congress Makes Suggestions

Congress continues to take measure of the housing potential with its Wagner-Ellender and related bills previously referred to in these columns (Sept., p. 16).

The Senate's Small Business Committee, eyeing the over-all picture, describes construction as a small business, and notes that nine out of ten firms doing construction work "do an annual volume of less than $50,000."

It has some pertinent suggestions up its sleeve:

1. State and local governments should replace out-dated building codes, zoning and land-planning regulations, and enact more uniform legislation on mortgages, foreclosures, titles, and licensing requirements.
2. Construction could be stimulated by revision of the tax base and structure to make improvement profitable.
3. It is vital to determine what steps can be taken by the federal government to coordinate the policies of credit organizations which lend money for construction and real estate.
4. Lack of uniformity in building codes in different localities seriously curtails widespread adoption of new products or new methods, and adds to the high costs of construction.
5. Adequate research, the results of which are made generally available, could increase construction volume and employment.
6. Solutions will have to be found not only for the problem of violent shifts in annual volume of construction but also for the problem of seasonal unemployment in construction due to the weather and other factors. Serious consideration will have to be given to the possibilities of annual wages and of extension of social security to cover all construction workers.

British Cancel Prefabs

It is of interest to note that, upon the termination of Lend-Lease, the Federal Public Housing Authority halted further production of temporary housing for British workers. About 10,000 of the original 27,000 order had been accepted by the British at that time. Houses produced but not accepted were to go through the process of being declared surplus and disposed of under the procedures of the Surplus Property Board.

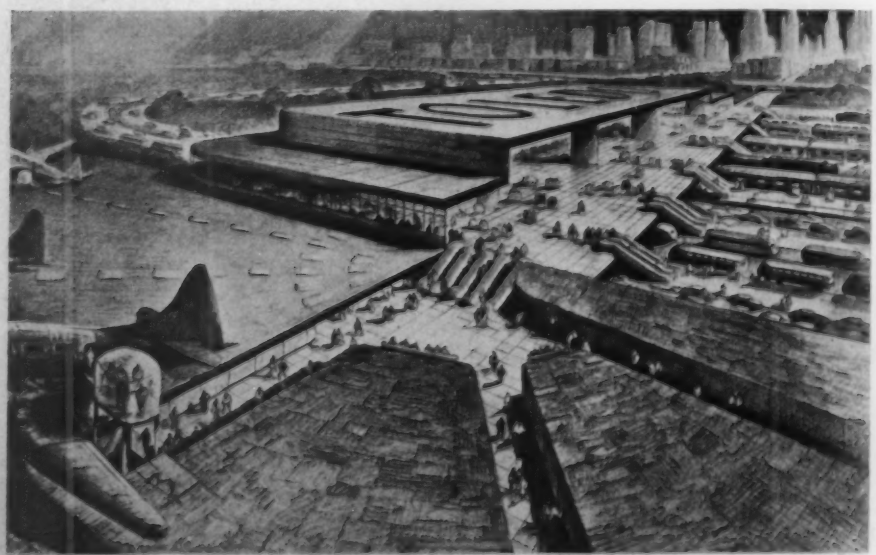
Public Works Must Wait

The general picture on public works remains much the same—that is, types of construction which seriously compete with private industry for critical materials will be withheld until there is some slack in the industry.

The federal government, as voiced through the Reconversion Office, wants Congress to provide more money for planning. In this connection, it points out that plans have been prepared for $1.5 billion in public works, including reclamation, flood control, veterans' hospitals, and others, but exclusive of road building.

Early in October the Federal Works Agency, jointly with the Post Office Department, asked Congress to authorize an appropriation of $193,000,-

(Continued on page 12)



Toledo's proposed train-bus-plane terminal: cut-away section showing waiting room, escalators, underground ramps and elevators to plane door. Drawing by Hugh Ferriss

How to cut today's building costs with ARMSTRONG'S MONOWALL*

ONE MAN, IN ONE DAY, can Monowall the average room. This modern wall surface for kitchens and bathrooms goes up quickly with dry-wall construction that requires little preparation. And Monowall's gleaming factory-finished surface needs no finishing on the job. Important, too, is the low cost of Monowall itself.

This high-density wallboard has a tough mirror-smooth finish in a wide variety of brilliant colors, plain or tile-design. Its durability and ease of maintenance have been proved in thousands of installations, residential and commercial. Monowall is produced under strict controls that assure uniform high quality.

For samples, catalog, and technical data, write to Armstrong Cork Company, Building Materials Division, Architects' Service Bureau, 2411 Lincoln Street, Lancaster, Pennsylvania.

* Reg. U. S. Pat. Off.

Dry-Wall Construction saves time, muss, and litter. Gypsum board is nailed to studs, and the Monowall is applied with adhesive. When remodelling is done, the original plaster is usually found to be a satisfactory base for the application of Monowall.

ARMSTRONG'S MONOWALL

MADE BY THE MAKERS OF TEMLOK INSULATION—SHEATHING, LATH, DE LUXE INTERIOR FINISH

MOTOR OPERATOR
SAVES LABOR

FLEXIBLE STEEL SLATS
SAVES MAINTENANCE

REMOTE CONTROL
SAVES TIME

No time or effort is wasted in opening (or closing) the Kinnear Motor Operated Door. Just a touch on the control button and the sturdy motor operator goes instantly into action, coiling the flexible steel slat curtain up out of the way, and clearing the opening completely. Floor and wall space can be utilized to within a few inches of the door.

The Kinnear Motor Operator, featuring a specially designed torque output motor, machine cut gears and bronze bearings is built into an integral unit of exceptionally long life and durability. Remote control switches can be installed at convenient points to save additional steps and time. The flexible steel slats of the curtain are strong and rugged, and are built to withstand years of continuous use.

These and many other Kinnear advantages add up to make the Kinnear Motor Operated Door a good investment. Plan to cut your door costs with the door that has proven its dependability . . . in many cases serving continuously for over 40 years.

Kinnear Doors fit openings of any size and are built to your individual needs. Write now to the Kinnear Manufacturing Company. Factories: 1860-1880 Fields Ave., Columbus 16, Ohio; 1742 Yosemite Avenue, San Francisco 24, California.

SAVING WAYS IN DOORWAYS
KINNEAR ROLLING DOORS

(Continued from page 10)

000 for federal building projects outside the District of Columbia, and to authorize as well various new structures in or near the District. In this connection a list of more than 4,000 eligible projects in the states and territories was submitted, totaling $774,795,000. The $193,000,000 items are to be selected on the bases of urgency and of equitable distribution throughout the United States.

When the request was made it was explained that the legislation would allow the Public Buildings Administration to purchase sites, to prepare working drawings and specifications and to construct the projects immediately needed. Types of building include Public Health Service hospitals, court houses, post offices, office buildings and other structures.

Public Works Bill Introduced

Another move in the field of public works is a bill by Senator Murray of Montana, S 1449, to provide for advance planning. His measure would set up a Construction Policy Board composed of the Secretaries of Agriculture, Labor and Commerce to advise the President and the Congress quarterly of the trend of construction, of changes in the relationship between construction activity and general business activity, and of the necessity for increasing or decreasing the prospective volume of construction. In addition two committees would be set up, one to be known as the Public Works Stabilization Committee of 10 members and the other to be a Construction Industry Advisory Committee of 16 members. The bill also would authorize funds for advance planning by non-federal construction agencies.

It should be noted, too, that the Congress has approved release of funds for road building under the Highway Construction Act.

As to federal thinking on prospective construction, Snyder tells Congress that, with the relaxation of controls, construction of more than 85,000 houses is expected during the last three months of this year. He estimates that over 400,000 homes will be begun in the coming year.

WPB ARCHITECTS, ENGINEERS AVAILABLE

Registered architects and engineers serving the War Production Board are now available to private industry, it is announced by John A. Warner, Direc-

(Continued on page 14)

Consult VAN DORN...

. . . WHEN PLANNING CONSTRUCTION AND EQUIPMENT OF *Modern Prisons*

● If you are planning a prison project you can obtain from Van Dorn engineers the most authentic, up-to-the-minute information on modern prison design and construction.

When constructing a new prison or remodeling an old one, Van Dorn has the manufacturing facilities and the erection skill to do an outstanding job. This is evidenced by the fact that Van Dorn has helped develop and build more prison projects than any other organization in America.

For 68 years the Van Dorn Iron Works Company has originated, designed and built prison and jail equipment and accessories. Among the improvements pioneered and developed by Van Dorn are the Fully Selective Keyless Locking Devices, the Van Dorn Interlocked Cell Bar Construction and Tool-resisting Steel.

A Van Dorn prison specialist will gladly call at your request. He will be helpful in many ways . . . and there is no obligation.

THE VAN DORN IRON WORKS CO.

2685 EAST 79TH STREET • CLEVELAND 4, OHIO

Apply war production efficiency to your peace-time operations with proper ventilation . . .
Swartwout Airmovers
provide low-cost highly effective ventilation with no power expense

Swartwout *Airmover* on a foundry roof

For lower production costs equip your buildings with truly *modern* ventilation. It pays you to do a complete job — the kind that noticeably increases workers' comfort and efficiency — that clears the air of unwanted heat, smoke and fumes in hundreds of factory workrooms today. Swartwout Airmover Ventilation saves money from the start (no costly power system to install) and brings handsome returns by reducing spoilage and accidents.

The Airmover Line includes Swartwout's low-height, big-capacity ventilator that virtually opens your roof to the sky for either small or large scale building exhaust; Heat Valve for ridge openings, and several styles of individual type ventilators; all designed to efficiently meet individual ventilation requirements.

Architects recognize the opportunity to provide highly effective *natural* ventilation without detracting from clean-cut modern building styles. Swartwout engineers will gladly make recommendations for easily-installed roof ventilating equipment. Write today for further information.

THE SWARTWOUT CO., *18511 Euclid Ave., Cleveland 12, Ohio*

Swartwout

The Airmover Line

EQUIPMENT FOR EFFECTIVE ECONOMICAL VENTILATION OF INDUSTRIAL BUILDINGS

(Continued from page 12)

tor of Region 2, consisting of New York State and northern New Jersey.

"The end of the war," Mr. Warner states, "has terminated many of the Board's activities, thus making possible the release of these specialists who have unselfishly remained with the Board until their tasks were completed. . ."

It is emphasized that the personnel now available have had repeated contacts with many trades and businesses during their association with the Board, thus expanding their knowledge of industry as a whole. "Moreover," Mr. Warner adds, "these men and women have mastered the technique of cooperation between business and government. Such an asset will become increasingly valuable to any firm, particularly during the reconversion period."

Employers desiring to interview architects, engineers and other construction specialists are invited to write to the Regional Director, War Production Board, Empire State Building, New York 1, N. Y.

CONSTRUCTION GAINS

Construction volume in the 37 states east of the Rocky Mountains continued to gain moderately in August, F. W. Dodge Corp. reports. Contracts awarded totaled $263,608,000, a gain of 2 per cent over July, and of 55 per cent over August, 1944.

The volume of construction of buildings to be used for manufacturing purposes expanded substantially, the August total of $75,456,000 being a gain of 46 per cent over July and 88 per cent over August of last year.

Although residential building in August declined 8 per cent from July's total, it was 83 per cent higher than in August, 1944. The total amount involved in August's residential contracts was $42,711,000.

Privately owned construction continued to dominate activity, representing 74 per cent of the total. It accounted for 90 per cent of nonresidential building, 93 per cent of residential building and 35 per cent of public works and utilities.

HOME CONSTRUCTION UP

Private home construction, in spite of wartime restrictions still in effect, is beginning to show an increase according to FHA Commissioner Raymond M. Foley.

Applications for insured financing on new homes to be constructed under the provisions of Title II of the FHA program averaged more than 1,000 a

(Continued on page 154)

They're NEW! They're STARTLING! They're PERMANENTLY BRILLIANT!

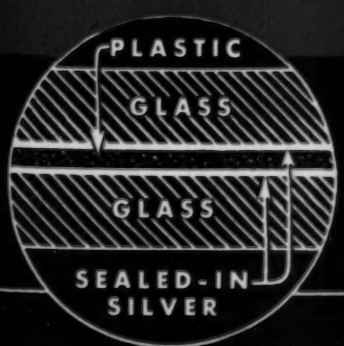
Safetee Mirrors

"SEALED BRILLIANCE"

PATENT APPLIED FOR

These remarkable new SAFETEE GLASS MIRRORS introduce—for the first time—four outstanding features and advantages:

1. Greater brilliance than ordinary mirrors.
2. Shatter-resistant like automobile glass.
3. Hermetically sealed reflecting medium, unaffected by moisture, temperature, corrosion and hard use.
4. Available in DOUBLE or Single-faced, sheet or plate, in the SAME THICKNESS.



Through Safetee's special laminated construction (patent applied for), these beautiful mirrors are many times as strong and can be several times as THIN as ordinary mirrors. The result is unusual brilliance of image, "feather" weight and high resistance to shocks and cracking. The "silvered" surface—only a fraction of an inch away from the FIRST surface of glass—is SEALED between glass and plastic and is unaffected by salt air or tropical climate. Single or double-faced mirrors are available in the same thickness, beginning at one tenth of an inch (.100").

Here is your TOP VALUE in quality mirrors—for handbag or boudoir, automobiles, public carriers, gift boxes, shaving sets, picture frames, wall mirrors, furniture, etc. Resilvering is eliminated, as SAFETEE MIRRORS are permanently sealed and the image remains sharp and brilliant.

★ ★ ★

Full particulars on sizes and prices sent promptly on request.

SAFETEE GLASS COMPANY

PHILADELPHIA 44, PA.

FOR BETTER BUILDING

BOMBERS TO BATHROOMS

That transparent plastic called Plexiglas, from which thousands of nose sections, turrets and other enclosures were made for every type of Army and Navy plane during the war, has at last emerged into civilian dress. The Rohm & Haas Co. of Philadelphia, developers of Plexiglas, has designed and is currently exhibiting a three-room "Plexiglas Dream-Suite" consisting of a transparent-walled bedroom, a dressing room, and a bathroom with a turret-shaped transparent shower stall, all intended to demonstrate the architectural uses of the material.

Novel ideas presented in the suite include: "radiant walls" in the dressing room, furnishing both decoration and illumination by means of hidden fluorescent lamps which edge-light the engraved and painted Plexiglas-covered wall surface; a built-in dressing table, the right-hand pedestal of which holds a graduated set of Plexiglas trays for cosmetics and other small items; a special compartment for hats and shoes, with a "lazy Susan" revolving hatrack above and Plexiglas shoe racks below; a small, compact bedroom with a sliding plastic door and one whole transparent wall to increase the sense of space, but equipped with translucent hangings for privacy; a four-color mural over the bed "painted in light" on Plexiglas sheets.

No plumbing is visible anywhere in the bathroom. The transparent, shatterproof Plexiglas shower stall has a semicircular sliding plastic door said to make the stall completely watertight. Instead of the usual spray head there are four bands of needle-sprays separately controlled. Automatic temperature controls with plastic handles are located both inside and outside the shower enclosure.

A turret-shaped shower stall, invisible plumbing, and a streamlined plastic toilet are features of the Plexiglas "Dream-Suite" bathroom

Bedroom corner has transparent walls, a four-color mural "painted in light"

A built-in dressing table offers Plexiglas trays for cosmetics and other items

A fluorescent-lighted ledge dramatizes Chinese prints above in Wanamaker room

"HOME OF VISION"

A compact "home service center," mirrored furniture and walls, fluorescent and phosphorescent treated wallpaper and accessories, fluorescent lighting concealed in cornices, coves and window valences, are features of the "Home of Vision" recently opened in the John Wanamaker store, Philadelphia. The Westinghouse Electric Corp.'s Better Homes Department served as consultant in designing the kitchen and laundry and the lighting and wiring throughout all the rooms.

The home service center — a combination kitchen, laundry and dinette —is designed to save time, steps and motion. For example, the kitchen has three separate work centers—for preparation of food, cooking and dishwashing — each serviced by cabinets and counter surfaces. All equipment in both kitchen and laundry is electric. Lighting is fluorescent, supplemented by local units in strategic spots, such as above the sink and under the cabinets over the work area.

WEATHER CONTROL

Based on the reversible cycle heat pump principle, a new compact, fully automatic unit, the *Reversatemp*, is said to keep room temperature constant despite outside weather conditions, the unit alternating between heating and cooling hourly if necessary. Units are available in sizes suitable to small homes or large buildings such as office buildings, hotels, etc. The smallest unit fits into a 3½ by 5 by 7 ft. space. Drayer-Hanson, 738 E. Pico Blvd., Los Angeles 21, Calif.

PLASTICS

Classification Issued

Culminating over two years of concentrated effort on the part of technicians in the plastics industry, the Society of the Plastics Industry, Inc., has just issued a classification of plastics molding materials.

The classification is aimed to provide data comparable to that which

(Continued on page 22)

THINK IN TERMS OF

STRAN STEEL

When You Design with STRAN-STEEL

You Give More . . . and Get More

When you design that new store, home or apartment building around a framework of Stran-Steel you give the future owner an unwritten guarantee based on a combination of steel permanence, increased fire-safety, and freedom from warp, sag and rot. At the same time, you strengthen your reputation for dependability and progressiveness, which, in turn, means additional business and profits for you.

Enterprising architects and contractors are thinking today in terms of Stran-Steel for the buildings of tomorrow . . . envisioning the ease and speed with which buildings framed with this uniform, precision material will be erected. For Stran-Steel is an ideal material with which to work. It's light, rustproofed, and features a patented nailing groove for quick and easy attachment of collateral materials.

Proved in more than one hundred and fifty thousand wartime "Quonset" buildings, Stran-Steel is ready to take its deserved place in the vanguard of today's quality building materials.

GREAT LAKES STEEL CORPORATION

STRAN-STEEL DIVISION • 37th FLOOR PENOBSCOT BUILDING • DETROIT 26, MICHIGAN

UNIT OF NATIONAL STEEL CORPORATION

Pick up your Weatherproof Van Dyke—rain or shine—and feel sure its color will never run. It's the all-weather pencil with the new insoluble lead that insures greater Pigment-to-Paper Write-ability... better legibility. Use any one of its 24 brilliant, easy-to-point colors for charts, drawings—or whenever you need MOISTURE PROOF MARKS. Sold in single colors and sets of 12 or 24.

5605 SKY BLUE	5622 ORANGE
5606 CARMINE	5623 BROWN
5607 YELLOW	5624 VIOLET
5608 SAP GREEN	5625 BLUE
5611 WHITE	5626 RED
5613 TERRA COTTA	5628 GREEN
5614 PURPLE	5629 BLACK
5615 LIGHT BLUE	5633 GOLD OCHRE
5616 MADDER RED	5637 DARK YELLOW
5617 LEMON YELLOW	5648 OLIVE
5618 LIGHT GREEN	5686 MADDER PINK
5619 GRAY	5683 VAN DYKE BROWN

5640 COMBINATION RED AND BLUE

FREE SAMPLE

Send for one of These Colors and See for Yourself

It's made by

EBERHARD FABER

Leadership

IN FINE WRITING MATERIALS SINCE 1849

EBERHARD FABER, Dept. AR-11, 37 Greenpoint Ave., Brooklyn 22, N.Y.

For test examination send FREE one of your No.____ Weatherproof Van Dyke Pencils.

*Name*____ *Position*____

*Firm Name*____

*Firm Address*____

*City*____

*Source of Supply*____

FOR BETTER BUILDING

(Continued from page 20)

has been available to those employing wood, metals and other materials in their operations. It presents in chart form a guide to the various properties of plastics molding materials as established by the material makers and molders. Both thermosetting and thermoplastic materials are included and values shown for their mechanical, electrical, optical, thermal, chemical and aging properties.

Copies of the classification chart and explanation are available upon request to The Society of the Plastics Industry, Inc., 295 Madison Ave., New York 17.

Flame-Resistant Plastic

A new flame-resistant Thalid impression molding resin, *Thalid XR540*, has been announced by the Plastics Division of Monsanto Chemical Co. The material is said to be the first commercially available impression molding resin that provides plastics-glass cloth laminates which are self-extinguishing and do not support combustion. Among uses of impression moldings are large aircraft components, chairs, tables and cabinets, and one-unit wall panels.

Acid-Resistant Wood

Structures exposed to the rapid deterioration caused by contact with acid solutions or fumes can be made acid-resistant, it is claimed, through use of *Asidbar*, a plastic-impregnated wood recently developed.

The wood already has been tested in such applications as in a spray type pickling machine, fume ducts, stacks to exhaust acid vapor and for covering the concrete floors and foundations under an elevated acid tank to protect the concrete against acid spillage. Use for greenhouse construction to ward off the destructive effects of moisture and decay is now being explored. Koppers Wood Preserving Technical Division, Orrville, Ohio.

Permanently Flexible Resin

Development of a new thermosetting resin demonstrating all the advantages of the low pressure type plus permanent flexibility is announced by the Resinous Products & Chemical Co. of Philadelphia. Known as *Paraplex P-10*, the resin was designed primarily for the laminating industry but is also being used to impregnate single or multiply decorative fabrics and glass cloth and as a casting or potting compound where fiber reinforcement is unnecessary.

(Continued on page 148)

Announcing .. To the Architects

The "WINCO" VENTILATING WINDOW

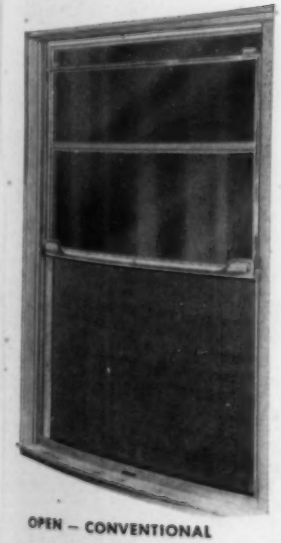
an aluminum package unit

for

homes
apartments
offices
hospitals
schools

CLOSED POSITION

VENTILATING POSITION

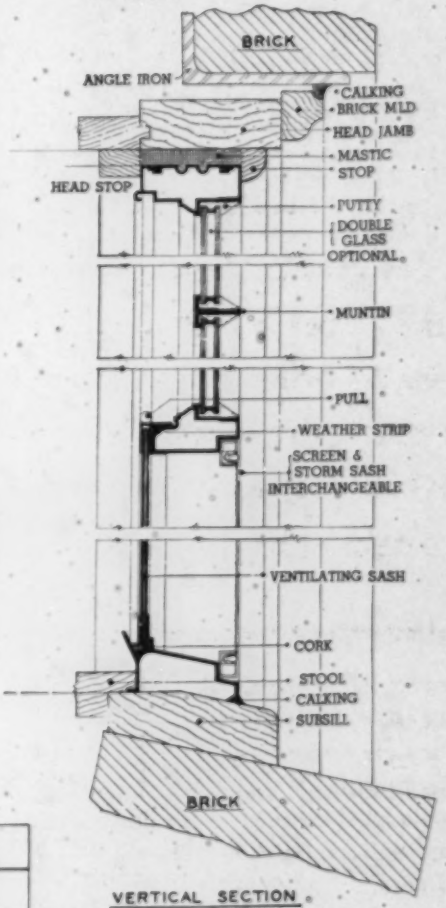


OPEN – CONVENTIONAL

ADVANTAGES

- Circulates the air over the entire room without draft.
- Nothing to wear out or replace. Has no pulleys, weights, cord or springs
- Will not stick, swell nor shrink. Easily installed, requires no special skill or tools.
- Weatherstripping not required.
- In non-draft ventilating position rain cannot enter. Preventing all risk of damage to drapes, floors, curtains, etc.
- Hinge type screens and storm sash are interchangeable.
- Washing of entire window can be done from inside without removing screen.
- Offers maximum visibility.

Stock sizes will be available through your local dealer. Information on special sizes upon request.



VERTICAL SECTION

Patented and Patents Pending

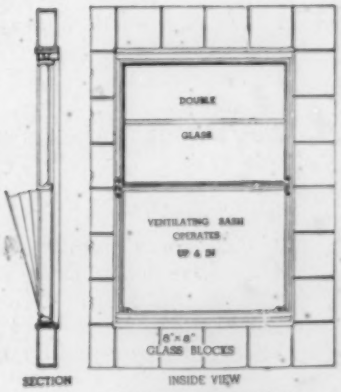
featuring

PATENTED

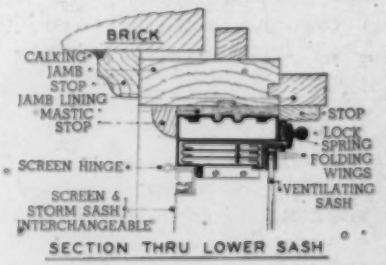
NON-DRAFT VENTILATION

WINCO

The Winco Ventilator Window is also made for glass block installations, with a stock aluminum frame to fit standard glass blocks. The entire assembled window inserted later. Screen and storm sash are used in the same manner.



GLASS BLOCK INSTALLATION



SECTION THRU LOWER SASH

WINCO VENTILATING WINDOW DIVISION

WATCO ENGINEERING, INC.

FLUORESCENT DIVISION — "TEMPZONE" AIR-CONDITIONING DIVISION

CLEVELAND, OHIO, U. S. A.

MANUFACTURERS' LITERATURE

AIR CONDITIONING

The Magic of Electronics in Air Filtration. Discussion of the theory of electronic air filtration, its efficiency, developments in its use, and typical applications. American Air Filter Co., Inc., First and Central Ave., Louisville 8, Ky.

Refrigeration and Air Conditioning in Hospitals (Bulletin 502). By Terry Mitchell, M.E. Reprinted from ARCHITECTURAL RECORD. Discusses air conditioning in nurseries, operating rooms, etc., storage of biologicals, refrigerating equipment. 4 pp., illus. Frick Co., Waynesboro, Pa.

CONVEYORS

Barrel Conveyors in the Petroleum Industry. Operating information on the handling of barrels and drums by conveyor system. 12 pp., illus. Lamson Corp., Syracuse, N. Y.*

CORROSION CONTROL

Cold Water Deaeration (Reprint #43). Description of a method of removing oxygen and carbon dioxide from process waters used cold, to prevent corrosive action. 4 pp., illus. Cochrane Corp., 17th St. and Allegheny Ave., Philadelphia 32, Pa.*

ENGINEERING INSTRUMENTS

Gurley Engineering Instruments (Bulletin 50). Condensed catalog describing transits, levels, alidades, etc., with full price list. 90 pp., illus. W. & L. E. Gurley, Troy, N. Y.

GLASS BLOCK

Beautiful Homes. How the glass block can be used in practical and interesting ways in all types and sizes of homes. Photographs, renderings and floor plans of houses by Paul Laszlo, George Fred Keck, Henry Otis Chapman and Randolph Evans, and others. Construction details. 34 pp., illus. Owens-Illinois Glass Co., Insulux Products Division, Toledo 1, Ohio.*

HEATING

Byers Wrought Iron for Radiant Heating. A working manual for architects and engineers. Detailed procedure is listed for figuring heat losses and piping requirements, designing the coils, supply and return mains. Factual data on the relative merits of locating the coils in floor and ceiling. History and theory of radiant heating. Typical installations. Notes on installation methods. Effect on wood floors. 52 pp., illus. A. M. Byers Co., Pittsburgh, Pa.*

LIGHTING

Light from Floors. The peacetime possibilities of the light-reflecting white-cement floor. Includes source material prepared in collaboration with authorities on illumination, design and construction. Gives recommended practice for construction of white cement concrete floor finish. 24 pp., illus. Universal Atlas Cement Co., 135 E. 42nd St., New York City.*

MOVIES IN INDUSTRY

Movies Go to Work. A general picture of the use of sound films in industry. 24 pp., illus. Bell & Howell Co., 7100 McCormick Rd., Chicago 45, Ill.

PORCELAIN ENAMEL

Porcelain Enamel, Its Characteristics and Qualities. Characteristics of and uses for porcelain enamel, description of how it is made and applied. Application details. Porcelain Enamel Institute, Inc., 1010 Vermont Ave., N.W., Washington 5, D. C.*

PUMPS

Deming Pumps Everywhere. The uses of one company's line of pumps in various fields — agriculture, factories, towns and villages, marine and aviation industries, and so on. 32 pp., illus. The Deming Co., Salem, Ohio.

REFRIGERATION COMPRESSORS

Gas Engine Refrigeration Compressors (Bulletin C-1100-B21); Refrigeration Compressors, Steam Engine Driven (Bulletin C-11-B22); Booster Refrigeration Compressors (Bulletin C-1100-B23). Description, specifications, typical installations. 12 pp., 14 pp., 6 pp. resp., illus. Worthington Pump and Machinery Corp., Harrison, N. J.*

RESIN GLUES

Bakelite Phenolic Resin Glues for Plywood. Describes Bakelite phenolic resin glues, their advantages, and the different types for hot-set bonding, warm-setting, cold-setting, and for molded plywood. 8 pp., illus. Bakelite Corp., 300 Madison Ave., New York 17, N. Y.*

SNOW REMOVAL

A study of Snow Removal (Case Study #4). Snow melting by means of underground hot water or steam wrought iron pipe lines. Specific information on five installations: (1) beneath the sidewalks of an office building; (2) in a residence driveway; (3) beneath crosswalks in an industrial plant; (4) in a truck driveway; (5) in a truck ramp at a factory. Design and installation practices. 6 pp., illus. A. M. Byers Co., Pittsburgh, Pa.*

SPARK PLUG BUSHINGS

"Heli-Coil" Spark Plug Bushings. Description of and advantages claimed for the Heli-Coil Bushing. Includes installation details. 8 pp., illus. Aircraft Screw Products Co., Inc., 47-23 35th St., Long Island City 1, N. Y.

STEEL JOISTS

The Steel Joist as a Structural Unit. General information on products and procedure, joist types, safe load tables, typical installations, construction details. 28 pp., illus. Macomber, Inc., Canton, Ohio.*

STORES

Your Appliance Store. Design information for the electrical appliance store: site selection, space requirements, basic types of store front, equipment layouts, demonstration display rooms, basic display units, wall and floor treatments, lighting. 48 pp., illus. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.*

TENITE

Tenite Cementing and Assembling. Procedure to be followed in cementing together pieces of molded Tenite. 2 pp. Tennessee Eastman Corp., Kingsport, Tenn.*

TURBINE GENERATORS

Worthington Turbine Generators (Bulletin 1960). Full description, installation details and applications of the various types of turbines. 46 pp., illus. Worthington Pump and Machinery Corp., Harrison, N. J.*

VIBRATION CONTROL

Vibration in Industry. The effects of vibration on plants, equipment and personnel, and methods of controlling vibration. 12 pp., illus. Korfund Co., Inc., 48-15 32nd Pl., Long Island City 1, N. Y.

WINDOWS

Truscon Steel Windows and Hangar Doors (1945 Edition). A catalog of steel windows approved by the Metal Window Institute and based upon the modular standards of ASA Project A62. Gives full particulars of types and sizes, installation details, etc., of windows, plus general information on hangar doors. 44 pp., illus. Truscon Steel Co., Youngstown 1, Ohio.*

*Other product information in Sweet's File, 1945

Photographs Courtesy Albert Kahn, Architects and Engineers, Inc.

SEVEN MILES LONG

mental structures build small with the same precision hey build big.

SEVEN POINTS OF SUPERIORITY IN CECO STEEL WINDOWS

1. Extra tight all-weather seal. 2. Easy opening and closing . . . no sticking or warping. 3. Controlled ventilation. 4. Durability . . . last a lifetime. 5. Bonderizing . . . special protection against rust. 6. Extra light area . . . lets more sun in, easier to see out. 7. These advantages at no premium cost!

OTHER CECO ENGINEERED PRODUCTS: All types of Steel Doors, Metal Frame Screens, Metal Lath, Metal Weatherstrips, Steel Joists, Steel Roof Deck, Meyer Steelforms, Adjustable Shores and Clamps, Concrete Reinforcing Bars and Welded Fabric.

ONSTRUCTION PRODUCTS

CECO STEEL PRODUCTS CORPORATION

5701 W. 26th STREET • CHICAGO, ILLINOIS

Manufacturing Division • Highway Products Division

Sheet Steel and Wire Division • Concrete Engineering Division

REQUIRED READING

Municipal Library, Sao Paulo, Brazil. From "Os Melhoramentos de Sao Paulo"

SAO PAULO REJUVENATED

Os Melhoramentos de Sao Paulo. By Francisco Prestes Maia. Sao Paulo, Brazil, Prefeitura Municipal de Sao Paulo, 1945. 9¼ by 12¾ in. 40 pp. + 412 plates.

It was in 1930 that the then architectural engineer to the municipality of Sao Paulo, Brazil, Dr. Prestes Maia, replanned the city on modern lines. Now, 15 years later, that same Dr. Maia as mayor is putting his plans to work. This book is his own account of progress to date.

Taking full advantage of topography and physical environment, the Sao Paulo scheme was started into effect with various avenues and street improvements to relieve the congested central area. The Tiete River's course in the urban district was shortened from 30 to 17 miles by a tremendous project of canalization. A municipal stadium, a public library, viaducts and a bridge are other items on Dr. Maia's improvement agenda already accomplished. Still ahead or now under way are additional new avenues, preliminary studies for a subway network, a city hall, playgrounds, elimination of level crossings, passenger train terminals, belt lines, new parks, zoning laws.

Although text and captions are written in Portuguese, there is a summary in English which is sufficiently detailed to make the photos thoroughly clear to American readers. And a study of them will prove interesting, for Brazil, along with much of the rest of South America, has developed a distinctive architecture reminiscent at once of both the European continent and the United States.

INDIA'S ARCHITECTURE

Magadha Architecture and Culture. By Sris Chandra Chatterjee, C.E. Calcutta, India (48 Hazra Rd., Ballygunge), Calcutta Univ. Press., 1942. 7 by 9¼ in. xxviii + 112 pp. 30 plates.

"Indian Architecture," writes S. P. Mookerjee in his foreword to this book, "has a record of unbroken development for thousands of years. But it has been neglected during the last two centuries. It has been treated as Museum treasure merely, as a dead subject for the student of history and culture to be acquainted with. It is our duty to make it living again. . ."

For this reason Mr. Chatterjee has given us the history of Magadha, with especial emphasis upon how the people lived. And like all accounts of ancient civilizations, the story has an irresistible appeal as it unfolds the extent of Magadha progress in the centuries before Christ. As Mr. Chatterjee says, the city of Rajagriha "was laid after the principles of fairly advanced Town-Planning." For example, drainage was not left to chance, but was carefully planned and executed with stone pipes and water channels and iron sluice-gates, emptying into a wide ditch outside the city walls, and thence, regulated by "gigantic" sluice-gates, into the fields for irrigation purposes.

The architecture was varied and interesting. "The houses in the suburb were built of brick and lime or mud masonry, the deep red bricks being close-jointed and rubbed smooth. They had lime-terraced floors carefully finished with a punning of molasses, cocoanut jaggery, pulp of 'haritaki' (myrobalan), etc. The unostentatiously simple carved pillars of seasoned wood dotted along the lean-to verandahs. Their timber-framed, gabled or vaulted roofs were sometimes covered with copper sheets or thick planks."

Inside the city proper there were rows of buildings of from one to 12 stories in wood and stone, with spacious gardens interspersed among them. "Roofs were built of granite slabs or other local stones, placed very close to one another and were sometimes supported by stone architraves and shafts with simple caps and bases. There were also roofs made of close-jointed bricks, 18 by 15 by 3 in., rubbed so smooth that the fine mortar joints were seldom noticeable. Walls were covered with shell lime plaster, richly polished and gorgeously painted in places. Coloured tiles, floral terra-cotta, coloured glass, metalled medallions, even leaves of gold and silver, were utilized in decorating the chambers of wealthy citizens." There were shops of all kinds, restaurants, beauty parlors, nightclubs.

With such a beginning, Indian architecture flourished, with a character all its own, down to the 16th century. Then Western civilization began to make itself felt, and "the beautiful local styles gradually gave way to a hybrid style, in both architecture and material." Mr. Chatterjee and the National Planning Committee would have the India of the future regenerate and readapt Indian architectural tradition and building materials. It is a worthy aim.

POLISH ARCHITECTURE

Studies in Polish Architecture. By Jerzy Faczynski. Liverpool 3, Eng. (Brodcee Hill), The Univ. Press of Liverpool. 8½ by 11 in. 120 illustrations. 21s.

Somewhat contrary to general expectations, perhaps, "Studies in Polish Architecture" is not a collection of sketches of existing and planned Polish buildings, but a portfolio of a very talented young Pole's imaginative renderings illustrating the chief characteristics of Polish architecture past and present.

Mr. Faczynski was studying architecture before the war. Now he is at it again, in Liverpool, the temporary seat of the Warsaw School of Architecture. To indicate the probable trends in Polish architecture, he includes several of his own sketches, full of Polish tradition, yet thoroughly modern in concept and feeling.

The value of this book is considerably enhanced by Zbigniew Dmochowski's brief history of Polish architecture and the marginal notes accompanying the drawings, taken from Polish professors and art historians.

WHAT IS ARCHITECTURE?

Architecture: A Profession and a Career. Washington, D. C., (The Octagon), The American Institute of Architects, 1945. 6⅛ by 9¼ in. 58 pp.

"Architecture is everyone's profession, for no one can escape it," says the introduction to this unusual booklet. "He who understands it best enjoys it most. The profession now stands ready to render a unique service to humanity. Toward this human objective this booklet has been written by educators and practitioners representing various points of view. It is intended for everyone—whether student or teacher, practitioner or client, layman or amateur."

There you have it. The booklet is published jointly by the A.I.A., the Association of Collegiate Schools of Architecture, the National Architectural Accrediting Board and the National Council of Architectural

(Continued on page 30)

NOW AVAILABLE --

FENESTRA STEEL BUILDING PANELS

Your opportunity to meet the demand for well-built structures in double-quick time

Now you can draw the new Fenestra Building Panels into your plans for roofs, walls, floors, partitions. They are available for contracts you are developing.

They are designed for fast construction —for savings in field labor. Panels interlock easily, firmly.

Fenestra Panels can be vapor-sealed and insulated. They are incombustible. Surfaces are *ready immediately* for application of finish treatments of your choice.

Possible variations in length, depth and gage permit great flexibility in building design. Repeated parallel joint lines provide patterns in keeping with modern architectural trends.

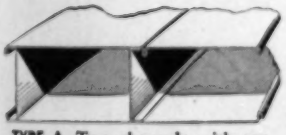
For further information, mail the coupon. And don't hesitate to submit your special application problems to our engineers.

WELL SUITED TO MANY BUILDING USES

Factories	Commercial Buildings
Superintendent Offices	Stores
Process Enclosures	Offices
Storage Enclosures	Schools
Garages	Hospitals
Gate Houses	Homes

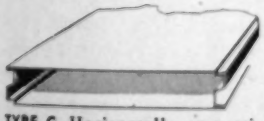
. . . and many others where economical, fast construction of sturdy floors, walls, roofs or partitions is desired.

FOUR TYPES

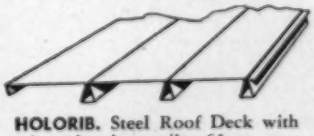


TYPE A. Two channels with top and bottom plate which, with service cover, form two-cell box beam.

TYPE B. One flat surface, two channel-type ribs. Flat side up or down, inside or outside.



TYPE C. Horizontally or vertically, for walls. Normally filled with insulation at the factory.



HOLORIB. Steel Roof Deck with triangular-shape ribs 6″ on centers, 1½″ deep, for spans to 8′.

Standard width of Type A, B and C Panels, 16″, in #20 to #10 gages. Holorib in #20 and #18 gages.

Fenestra BUILDING PANELS FOR ROOFS WALLS FLOORS

DETROIT STEEL PRODUCTS COMPANY,
Building Panels Division (*formerly Holorib Div.*)
Dept. AR-11, 2267 E. Grand Boulevard,
Detroit 11, Michigan

Please send me, without obligation, information on Fenestra Building Panels.

Name_____

Company_____

Address_____

BEWARE OF

"DOUBTFUL ORIGIN!"

There are mongrels in lighting products, too! You know the kind—a bit of light-gauge metal, haphazardly bent to shape . . . probably bootleg wiring parts . . . a slip-shod paint job.

Now that our war contracts are a closed book . . . now that you can once again obtain SILV-A-KING fixtures . . . why even consider these mongrels of the lighting industry? The metal that goes into SILV-A-KING products is the best heavy-gauge steel available. The lifetime porcelain-enamel finish on SILV-A-KING fixtures is there for keeps. The engineering and manufacturing "know-how" behind SILV-A-KING fixtures is something you just can't expect from the "tin-knocking" crowd . . . something you take for granted in products that bear the SILV-A-KING label.

SILV-A-KING "SPECIFICATION"

Lifetime porcelain fluorescent unit

CLOSED-END UNIT

RLM

OPEN-END UNIT

BULLETIN 45 FS—YOURS FOR THE ASKING!

BRIGHT LIGHT REFLECTOR CO. INC.

Fairfield and State • Bridgeport 5, Conn.

SILV-A-KING LIGHTING EQUIPMENT

SINCE 1921

REQUIRED READING

(Continued from page 28)

Registration Boards. It consists of a number of short papers written by such men as Turpin C. Bannister, William Lescaze, William W. Wurster, Walter R. MacCornack, Douglas W. Orr, Ernest Pickering, Paul Weigel, Leopold Arnaud, Kenneth Stowell.

Those who put this booklet together knew what they were doing. Starting with a chapter on "The Drama of Architecture," continuing through "The Architect and His Relation to Contemporary Life" and "The Professional Training of the Architect," they lead us straight through the various architectural agencies, the A.I.A. included, to a final discussion of "Architecture as a Career." In other words they tell us what architecture is, how it got that way, what it does, and who does it.

ARCHITECTURAL TERMS

A Short Dictionary of Architecture. By Dora Ware and Betty Beatty. New York 16 (15 E. 40th St.), Philosophical Library, 1945. 5½ by 8 in. 110 pp. illus. $2.75.

Here is a book of handy size which the architectural student should welcome, and which even the professional architect may well find a useful addition to his reference shelf. For it defines 791 architectural and building terms in common usage today, and illustrates a great many of them. It also gives, capsule style, the historical origin of a number of the older terms, and includes a short bibliography. An introduction by John Gloag discusses "The Study of Architecture," with emphasis on its history.

BLUEPRINT READING

Building Trades Blueprint Reading. By J. Ralph Dalzell. Part I, Fundamentals: Part II, Specifications, Blueprints, and Examinations. Chicago, Ill., American Technical Society, 1945. 8½ by 10¾ in. 142 and 234 pp. illus.

Since the success or failure of a textbook depends in large measure upon its clarity and directness, these two volumes by Mr. Dalzell should hit the jackpot. They are exceptionally clear—so clear, in fact, that they could be used for home study without benefit of instructor, although they are not intended for anything but class work.

The first of the two volumes presupposes no knowledge whatever of building. Starting from scratch, it explains elevation views, gives a glossary of elevation terms and illustrates the symbols used, then does exactly the same thing for plan views and terms and structural details. For every two

(Continued on page 166)

ARCHITECTS SPEED RE-EMPLOYMENT

A radio message from the editors of Architectural Record to the American public, delivered by Kenneth K. Stowell over 200 stations of the Mutual Broadcasting Company network October 10, 1945 and further broadcast by transcription

If you wonder why the building industry is bound to play a major role both in providing employment and in ushering in an era of prosperity, just stop for a minute to consider these few simple facts:

First, we need buildings for everything we do. Houses to live in, schools to learn in, factories to work in.

Second, we have not been building during the war, except for war purposes. We should have been building half a million houses every year during the past four years, so we are short at least two million homes, to say nothing of all the other types of buildings; and the old buildings are becoming obsolete and must be remodeled, repaired or replaced.

We should construct an average of 800,000 homes every year for the next 10 years. Think what this means in terms of jobs. Masons, carpenters, plumbers, electricians, painters, will have all and more than they can do. But beyond that the building industry reaches back through hundreds of factories to the forests that produce the lumber, the mines that produce the metals, the chemical plants that produce the plastics. So for every man working on the construction job, there are six or seven men involved in producing the materials and equipment that make up the house, the school, the hospital, the store, the airport and all the rest.

Building means jobs, thousands of jobs, but the workmen need blueprints before they can begin to work.

Architects are working day and night, producing the necessary plans and specifications. More draftsmen are needed this minute in the architects' offices to turn out the blueprints so that other men can start to work in the field. The architects are designing exciting new buildings, up-to-date, efficient, economical, as convenient as they are thrilling to look at.

Third, these buildings can be started soon. The government is now releasing all limitations on the production of building products and equipment. Factories are speeding up to provide the doors and windows, bathtubs, heating plants, and lighting fixtures necessary for the buildings the architects are planning. Contractors are figuring costs, searching the market for building materials, assembling their construction crews. They need more men, trained men in all the building trades.

A deciding factor in the amount of building that will be done is the answer to this one question, "Where can we get enough efficient, trained men to construct the buildings now being planned?"

So there will be jobs galore, more jobs than men to fill them, in the building industry in the next five years, and behind them are the thousands of jobs in the factories producing building materials. The construction industry is set to provide you with the new homes and hospitals, schools and stores—every kind of building you need. And building means jobs.

AMERICA PROGRESSES
THROUGH CONSTRUCTION

New construction insures production and employment

The speedy production of more goods for more customers which creates more employment, requires construction of new factories and modernization of old ones.

Surveys show that manufacturers are preparing to invest nearly five billion dollars in plants, equipment and alterations in 1946. It has also been estimated that under a favorable and prosperous business era, over one hundred and twenty-five billion dollars will be invested in industrial construction in the next ten to fifteen years.

Efficient and economical construction, planned by competent architects and engineers and executed by qualified general contractors is essential to American Progress. Contractors identified by the emblem of the Associated General Contractors of America, Inc. can be depended upon because of the business principles for which this emblem stands.

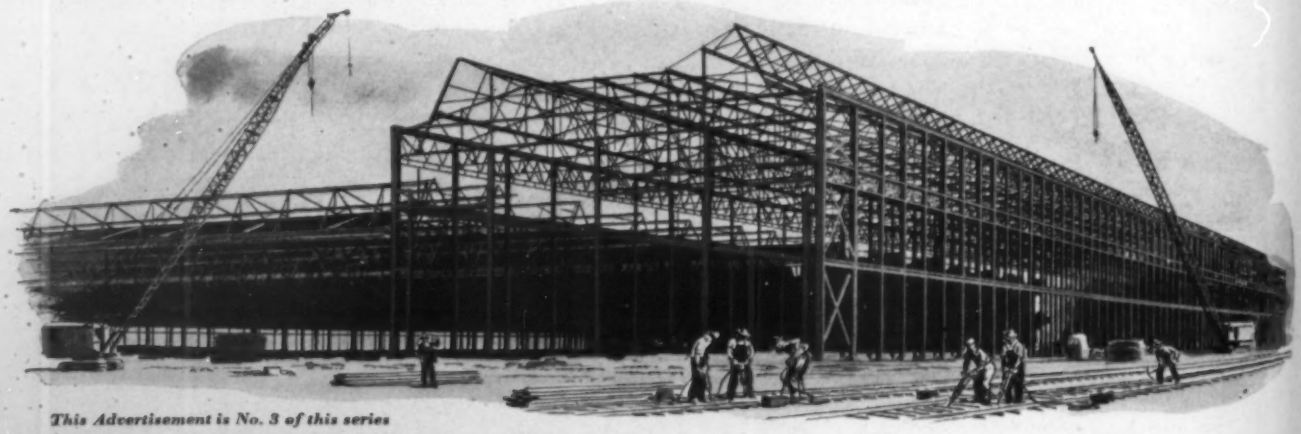
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
A G C
SKILL INTEGRITY RESPONSIBILITY
REG. U.S. PAT. OFF.

THE ASSOCIATED GENERAL CONTRACTORS *of* AMERICA, INC.

Ninety Branches and Chapters Throughout America

National Headquarters — Munsey Building, Washington 4, D. C.

SKILL, INTEGRITY AND RESPONSIBILITY IN CONSTRUCTION OF BUILDINGS, HIGHWAYS, RAILROADS, AIRPORTS AND PUBLIC WORKS



This Advertisement is No. 3 of this series

Setting New Standards

✦ To some a standard is something fixed, established, permanent, t be adhered to, used as is, or copied. To others a standard is a starting place, a spring-board, a point of departure. To those holding the latter concept the standard is subject to change, improvement, development. A little research into the history of standards bears them out. So our plea, and our purpose and program are for ever-improving standards. Only by changing standards can architecture, or any other art or science develop for the better service of mankind.

✦ New standards are constantly being established in every field by the evolutionary process of improving on what has gone before, eliminating that which no longer serves its purpose well, replacing it with that which functions better. Cases in point are the new research buildings which industry and educational institutions are establishing, not only in this country, but throughout the world. And government itself is preparing to launch an unprecedented program of research. The country's leading scientists are, at the moment this is written, giving their testimony in regard to research and the program for carrying it on. All these are dedicated to the raising of standards, at an increasing tempo.

✦ In the research laboratories themselves we find new standards of planning, space-use, flexibility, adaptability—of facilities, equipment, materials, and processes. And in them will be developed new standards of transportation, communication, education, and health—to mention but a few fields of endeavor. Public consciousness of the results of research is aroused by the flood of stories about the atomic bomb development. The public is ready for researchers to continue to produce the impossible.

✦ Every architect's office is of necessity a research laboratory devoted to raising the standards of our environment. Every architectural publication is a reporter of newly-evolved standards—standards to be raised, to be improved upon in the next building to be developed on the architect's boards. "Research" is inventiveness and ingenuity applied to present standards, not "searching back" (as the word may seem to imply) to find a standard merely to be copied.

✦ Even the standards established by law in building codes must change. Standards of performance must be substituted for the static standards which dictate obsolete means instead of desired ends. These are being changed; the research of all factors in the industry makes it inevitable—architects, engineers, manufacturers, builders are setting the new standards that eventually, and soon, will be reflected in the codes of the country. Standards are made to be superseded by superior standards. Recognition of that fact means real progress—in architecture as in every other field of human activity.

Kenneth K. Stowell

EDITOR

FIRESTONE RESEARCH

Laboratory Building for Firestone Tire & Rubber Co., Akron, Ohio

LABORATORY

Voorhees, Walker, Foley & Smith,

Architects and Engineers

Sigurd Fischer photos

As industry's new building program enters the stage of construction, it is clear that the big news is in buildings for RESEARCH. Research is the challenge of the times. Science is the new competitive weapon, in the competition not only of rival American industries, but also of rival countries in the international markets. It is the typically American answer to the threat of foreign cartels. And, by no means least, it is the best visible means of extending horizons, of providing jobs for all, of protecting and enhancing American standards of living.

For architects and engineers, it follows automatically that research laboratories will challenge them to reach new heights of ingenuity. Scientists in their technological hurdle race, must have the finest, fastest, most flexible facilities. The architects for this research

Sigurd Fischer photos

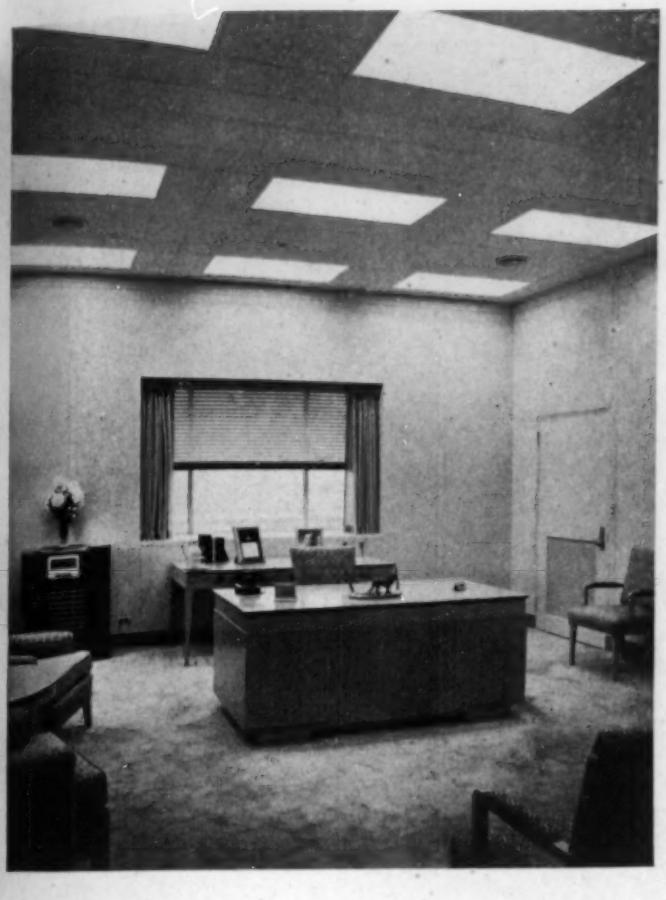
The entrance lobby is inviting, attractive, comfortable, and features a large display case opposite the doors. The lobby is flooded with natural light from glass walls at the front and sides. Opaque walls are of rich blue glass. The carpet is beige-gray; the upholstery background is tan. Recessed ceiling lights are integral features of the design. Opposite page, the executive office of the chairman, who was the company's first chemist and supervised the design and construction of the building; far right, a view of the library

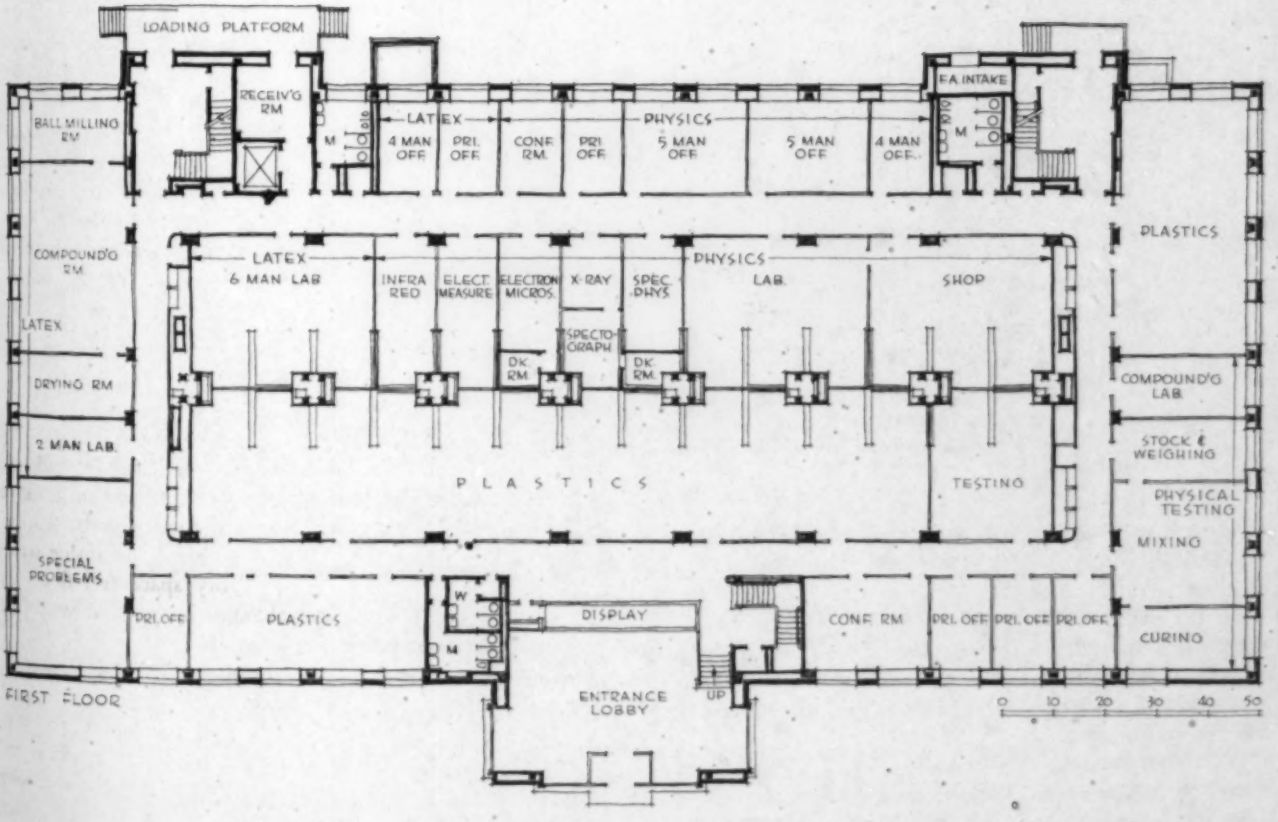
building, Voorhees, Walker, Foley & Smith, have taken many pioneering steps in the laboratory field, but never so many in any project as in this one for Firestone.

Wartime necessity gave this lab something of a flying start. As production expanded, the working areas of the Firestone plant pushed onward until they ran into the older laboratory, and then kept right on going. So the new lab was one of those wartime jobs in construction that can hardly wait for the architects' first cerebration. Establish wall and column locations, then race to keep the planning at least one step ahead of the workmen. The building went into service this year, its 100,000 sq. ft. costing a total of some $2,000,000.

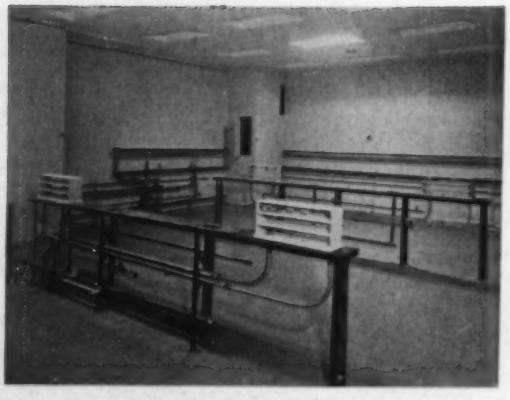
The building is inside out in two or three major respects. In the first place, it is in effect not just one building, but two, one inside the other. The exterior walls are separate from both. If this does not quite add up to three buildings, in essence this concept does describe the scheme. The outside is but a fixed shell enclosing an inside structure designed to give the laboratory space full flexibility for the countless shifts and changes in use that would be the normal expectation for laboratories.

Exterior walls are of conventional bearing construction, but they only carry themselves, not the building load. Inside there is a separate reinforced concrete frame, with slab floors. Inside that there is a completely prefabricated interior system of steel walls, ceilings and partitions, with fully demountable and interchangeable panel units so that




LOADING PLATFORM
RECEIV'G RM
BALL MILLING RM
M
LATEX
4 MAN OFF
PRI. OFF
CONF. RM.
PRI. OFF
PHYSICS
5 MAN OFF
5 MAN OFF
4 MAN OFF
M
E.A. INTAKE
PLASTICS
COMPOUND'G RM
LATEX
DRYING RM
2 MAN LAB.
SPECIAL PROBLEMS
LATEX
6 MAN LAB
INFRA RED
ELECT. MEASURE
ELECTRON MICROS.
X-RAY
SPECTO-GRAPH
SPEC. PHYS.
PHYSICS
LAB.
SHOP
DK. RM.
DK. RM.
PLASTICS
TESTING
COMPOUND'G LAB.
STOCK & WEIGHING
PHYSICAL TESTING
MIXING
CURING
PRI. OFF.
PLASTICS
W
M
DISPLAY
CONF. RM
PRI. OFF.
PRI. OFF.
PRI. OFF.
ENTRANCE LOBBY
UP
FIRST FLOOR
0 10 20 30 40 50

For the endless variety of experiments for which it is intended, a laboratory becomes a vast network of piping and wiring, here concealed in pipe cabinets



Photographs on this and following pages courtesy Firestone Tire & Rubber Co. and E. F. Hauserman Co.

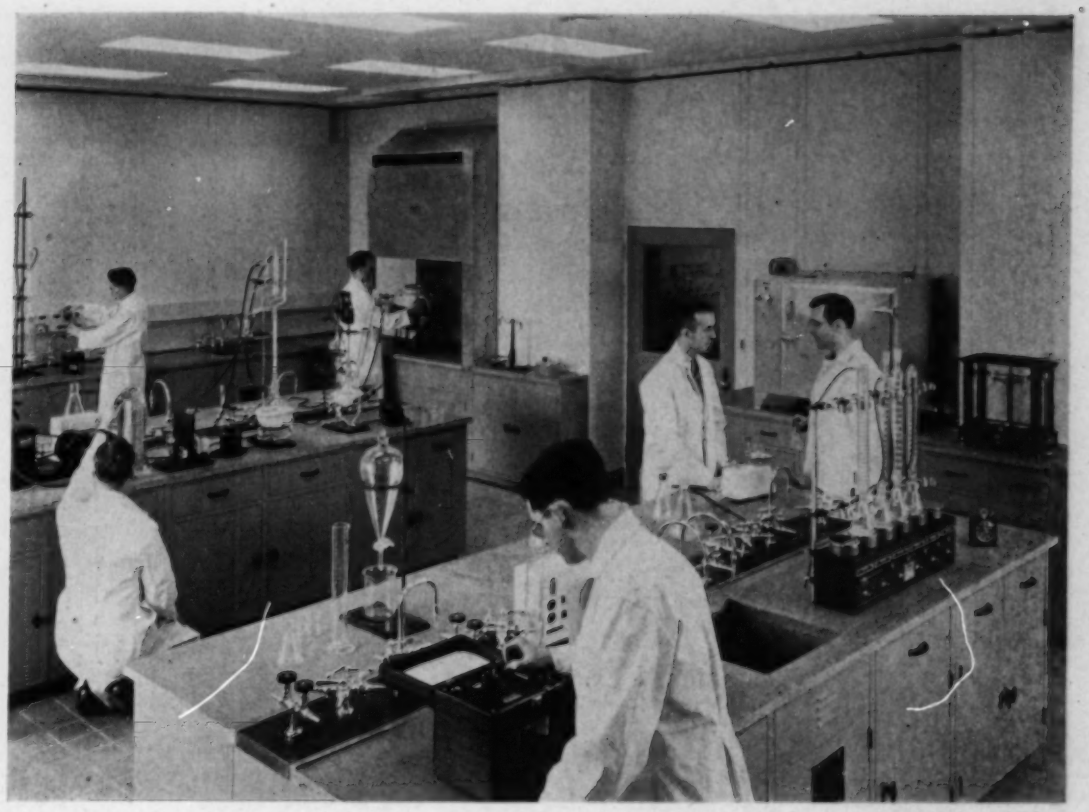
changes can be made easily and economically.

The inside-out theme is seen also in the plan. Instead of giving the laboratory rooms the outside space with daylight, the planners have used the perimeter for offices, library, stairs and so on, and put the laboratories in the interior. The result is a daylighted office building which serves as the enclosure for a windowless, air conditioned laboratory building.

If at first thought this hemming in of the lab rooms does not seem to check with the all-important requirement of flexibility, remember that it is flexibility of use that counts. This the prefabricated interior does provide, although one of the most important elements in the flexibility has not yet been mentioned; that is the unique system of providing the many service lines—water, gas, electricity, air, etc.—necessary to laboratory work.

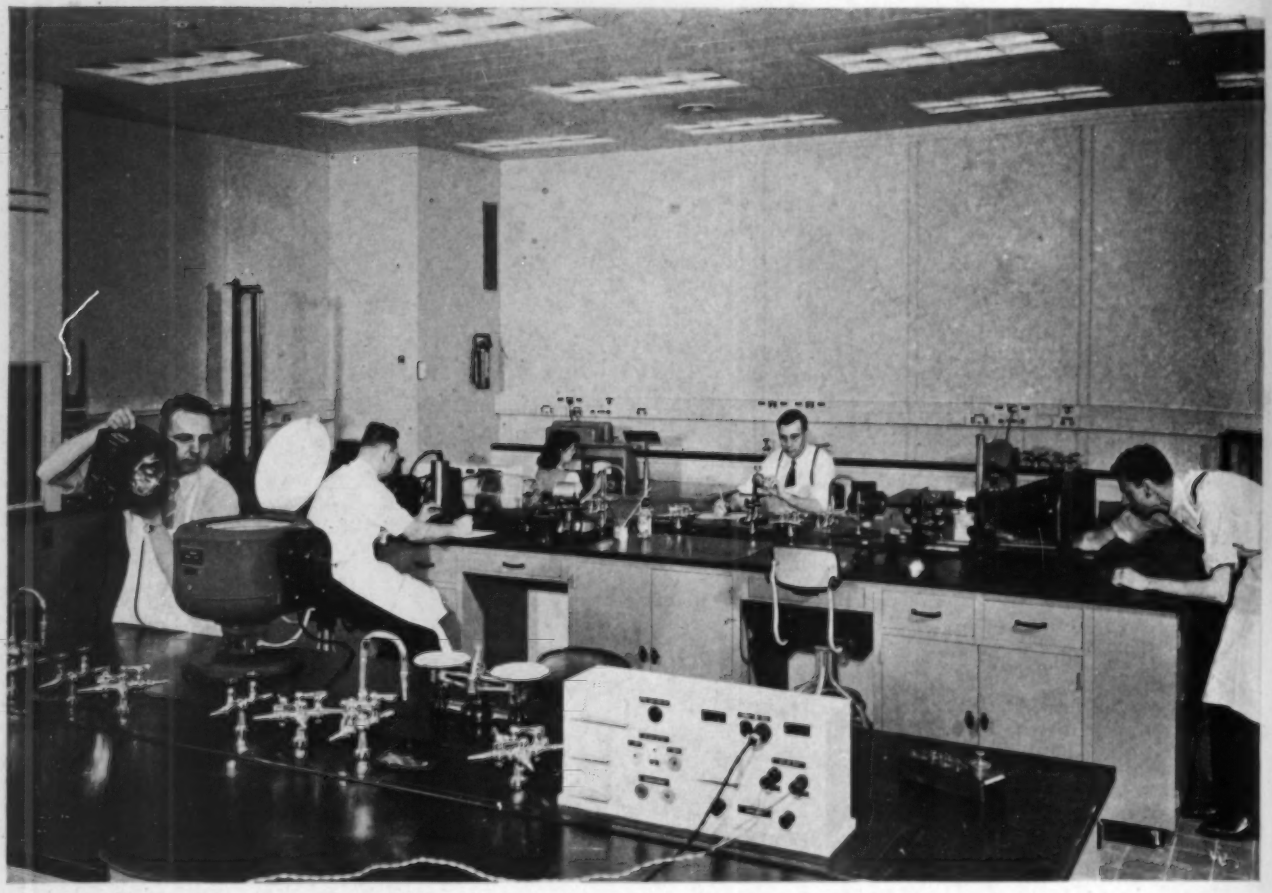
First, however, the wall system. The building is laid out with various modules ranging from 24 ft. down to 1 ft. Columns are spaced at 24 ft., to permit a subdivision of space into 12-ft. units, 12 ft. being considered the mini-

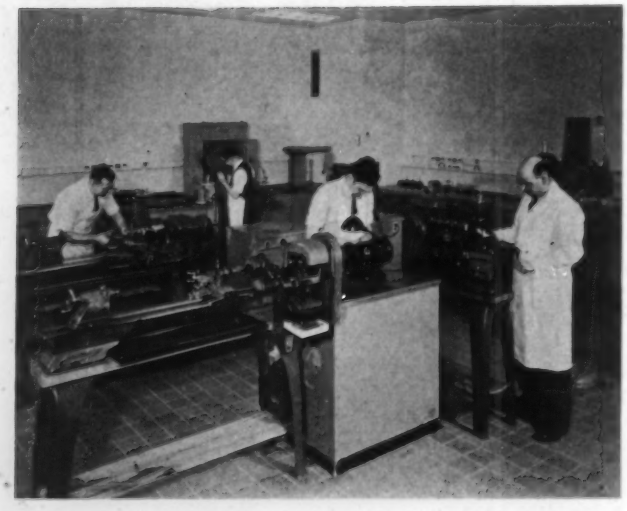
White piping and wiring for several laboratory services are available at all table positions, all of it can easily be changed at will, none of it is visible



Piping is independent of the tables themselves, running in narrow cabinets between tables. In this view tables have not yet been put in place; piping is ready

Laboratories are divided as occasion demands, from 2-man rooms to great areas. Here is a 6-man section in normal use. Below, lab in use as machine shop

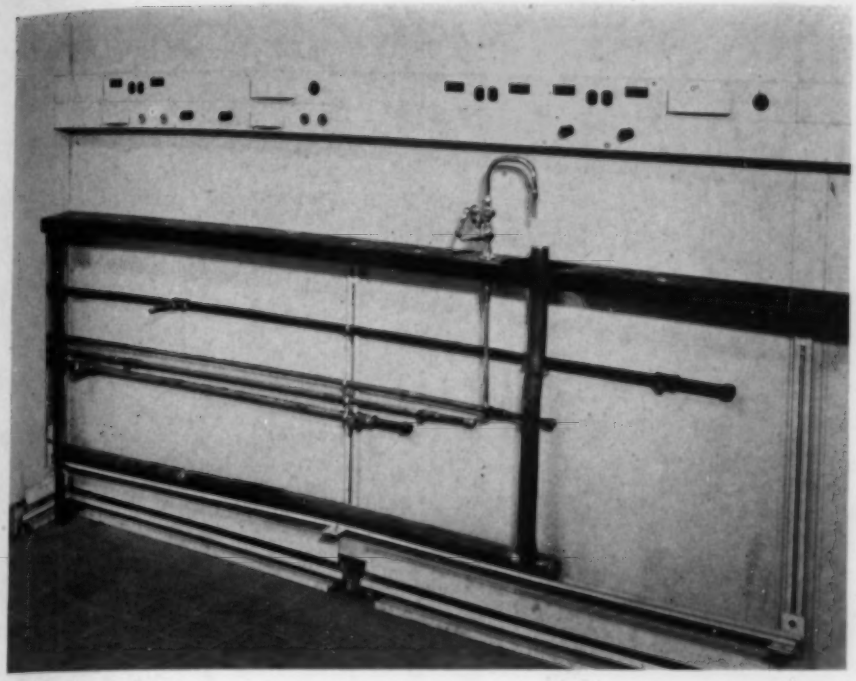




mum for a workable laboratory. The prefabricated steel wall and partition system uses a 4-ft. module for wall sections. The ceiling modules get down to 12 in. to accommodate steel acoustic tile. Recesses for fluorescent lighting are arranged to fit into this module scheme, so that lighting can be shifted around just about as desired, and the ceiling fitted around new locations without any cutting or replacement.

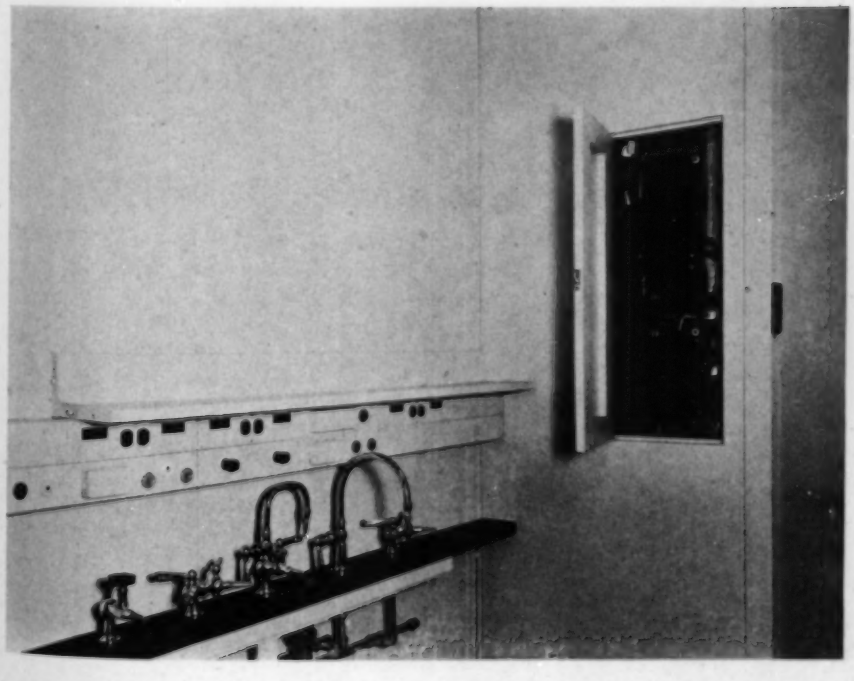
Service lines, which make any laboratory building a vast network of piping, are not the least of the architects' problems in the provision of flexibility. Here the list is extensive: electricity, both AC and DC, in several different voltages, even including some three-phase AC; distilled water; hot water; chilled water; gas; vacuum; air at 20 lb. and 100 lb; steam at 50 lb. and 160 lb.; plus, of course, the laboratory drains.

Naturally all of these services must be available at virtually any spot, and the requirements vary with different laboratories and changing uses. It must be possible to get any one of these piped in quickly, and there must



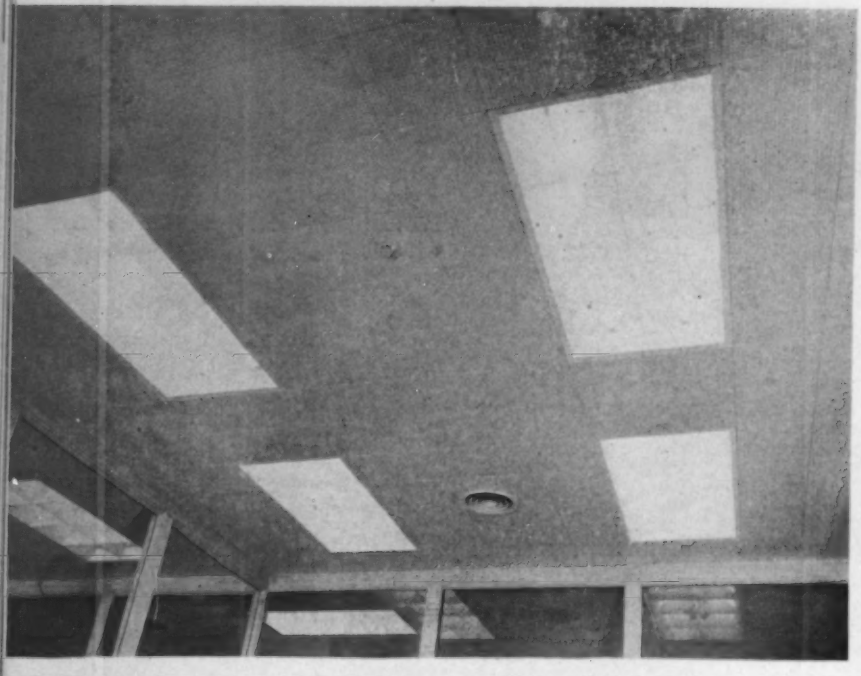
The narrow service cabinet at the partition is but 6 in. wide. Covers removed to show piping on hangers

It may not look like it, but this photograph illustrates the operation of a "forced vibrator which measures the physical properties of rubber vibrating at high speed"

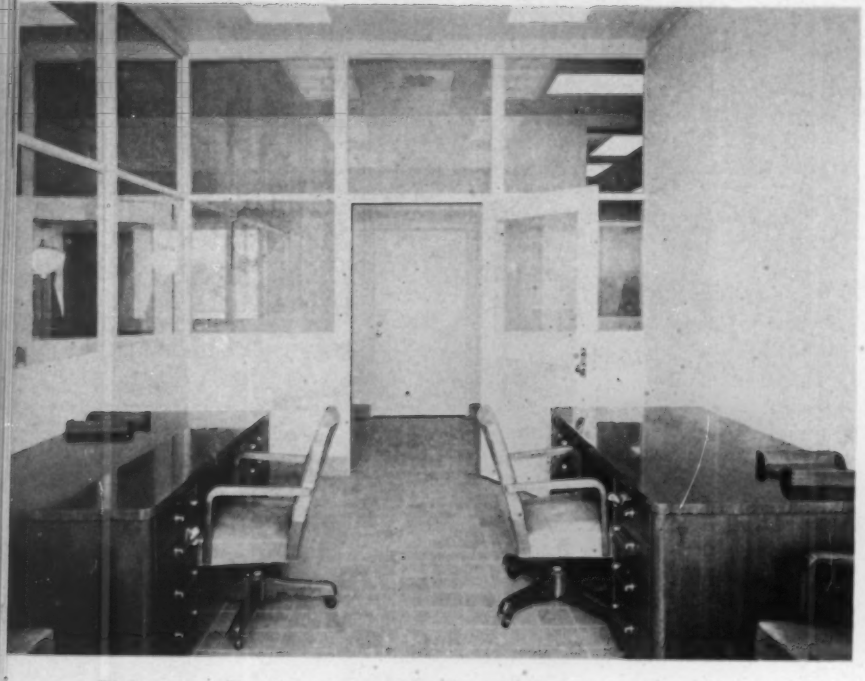


Electric services to wall cabinets come in two demountable troughs, wired as desired from the column

Fluorescent light troffers in the ceiling are integrated with module system (module is width of acoustic tile); can be removed as desired



Pretending her clothing had caught on fire, this girl is demonstrating safety showers installed at several positions in all of the corridors



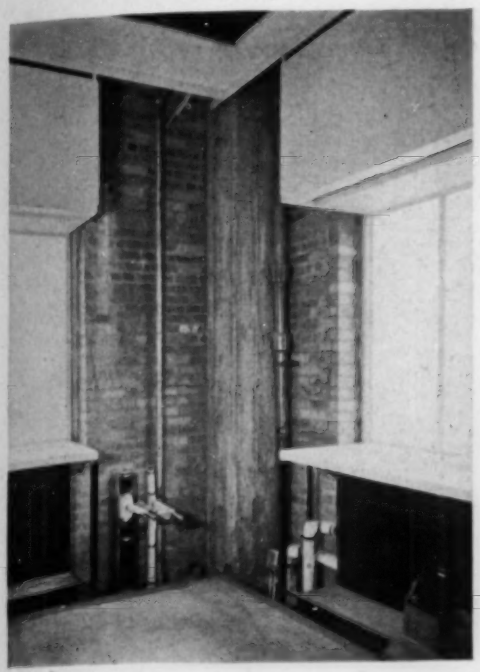
Firestone policy is to use virtually no obscure glass partitioning; this policy has the fortunate effect of allowing daylight to filter to interior

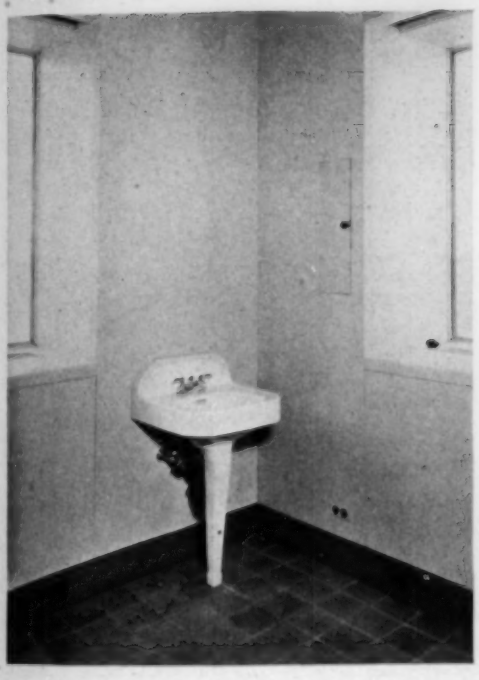
View of a typical corridor, offices with clear-glass partitions at left, laboratories at right. Recesses and closets are in prefabrication system

be provision for special ones that might later be needed.

The service lines layout in this building goes to some new lengths to meet these requirements and still to keep all piping under cover. First of the new wrinkles developed is a completely free pipe shaft at every 24 ft. along the center of the building. To keep the shaft clear of supporting steel required a special column arrangement. At these shaft locations, where normally there would be a single column, there are actually four separate ones, one at each corner of a space measuring 4 by 6 ft. (Detail p. 93). One side of this rectangle is closed by a large vent shaft for the air conditioning system, but service lines can feed out in the other three directions. They may go directly out along the partition, or they may run out at the floor level in pipe trenches. As shown in the floor plan, the pipe trenches make it possible to serve laboratory

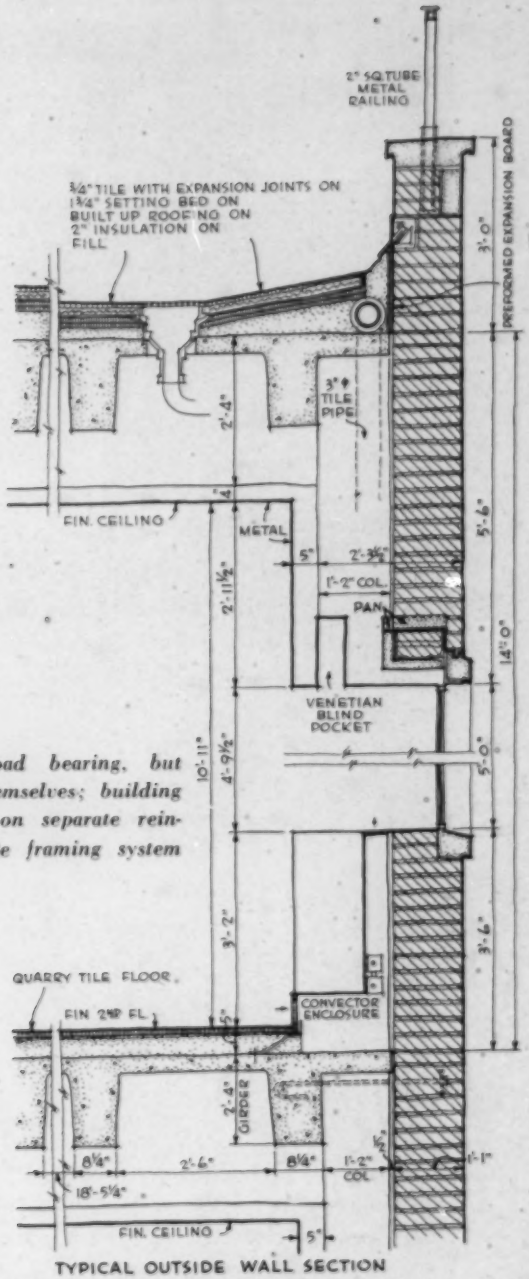
Here is an outside corner before wall panels were installed. Note brick piers and separate column, also raised slab floors, window enclosure system



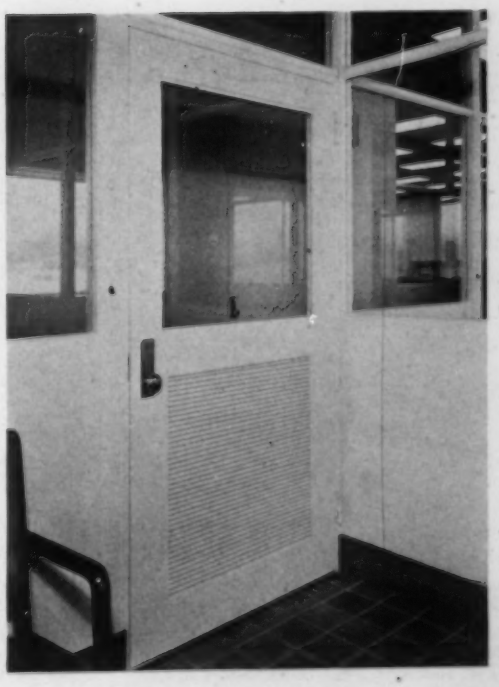


The same corner as above, after panels were all in place. Walls flush with radiator enclosure leave room behind for heating and service pipes

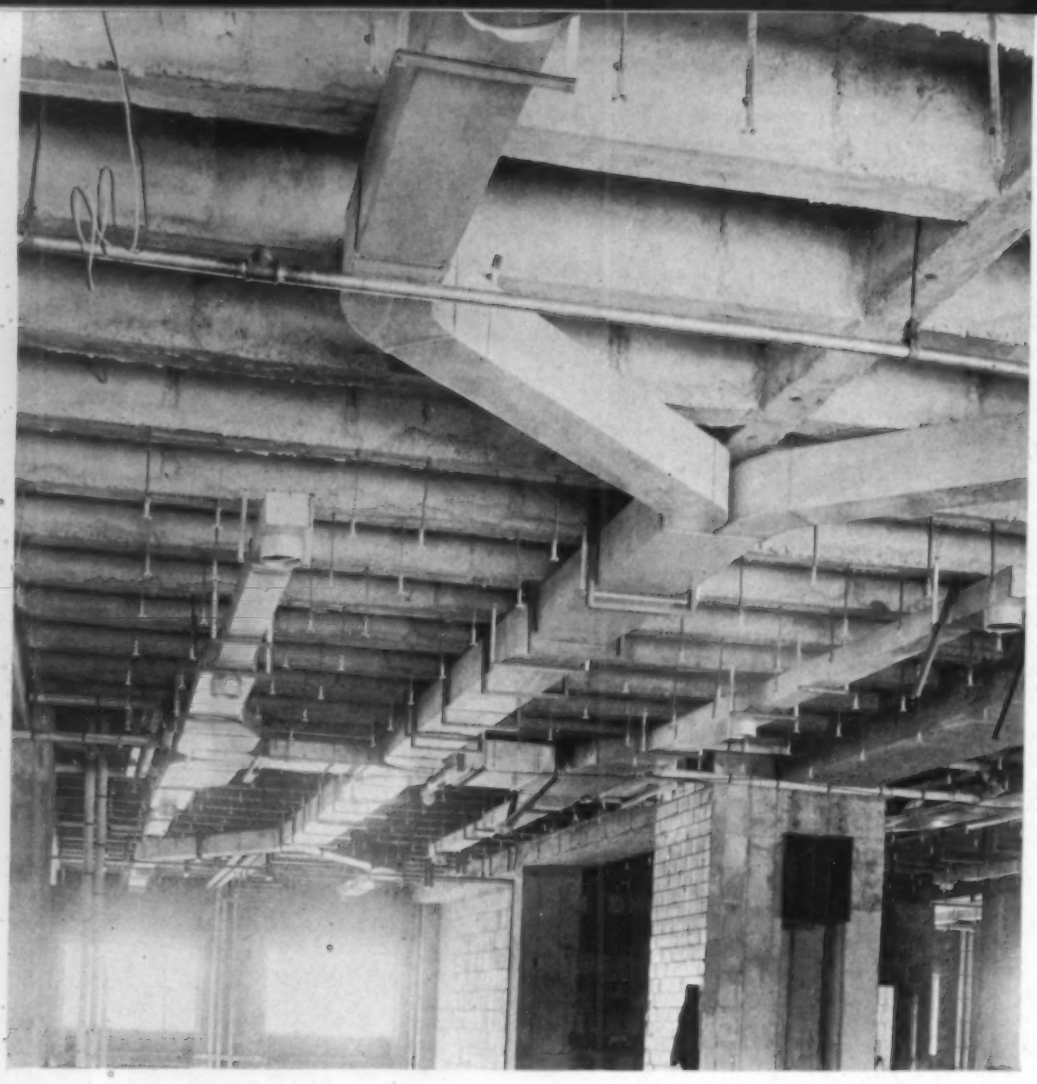
Walls are load bearing, but carry only themselves; building is supported on separate reinforced concrete framing system



TYPICAL OUTSIDE WALL SECTION



All doors, whether solid or glazed, are louvred to permit air conditioning exhaust air to pass from office, through laboratories, to vent shaft

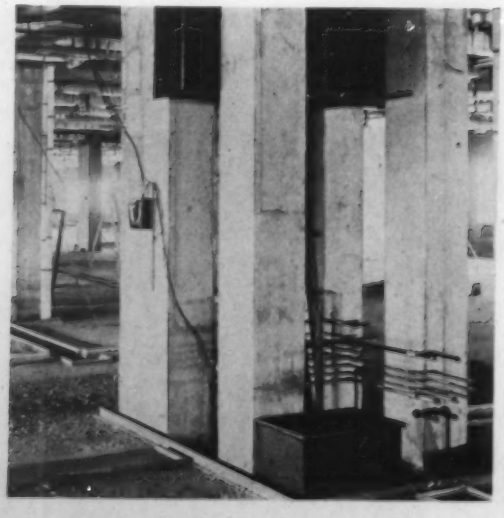


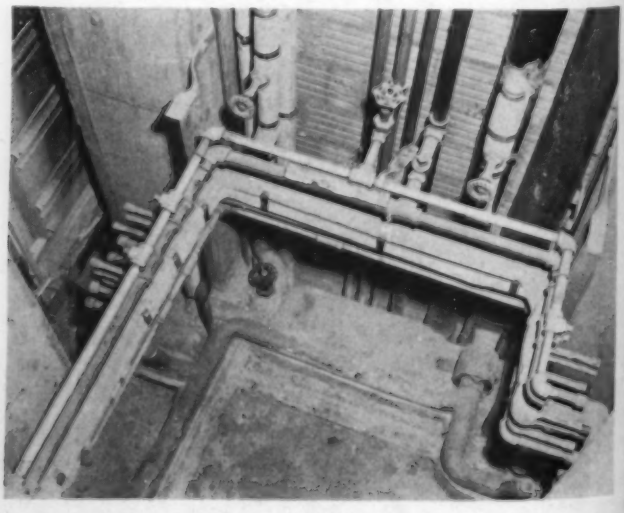
benches either along the wall or in island positions within the room.

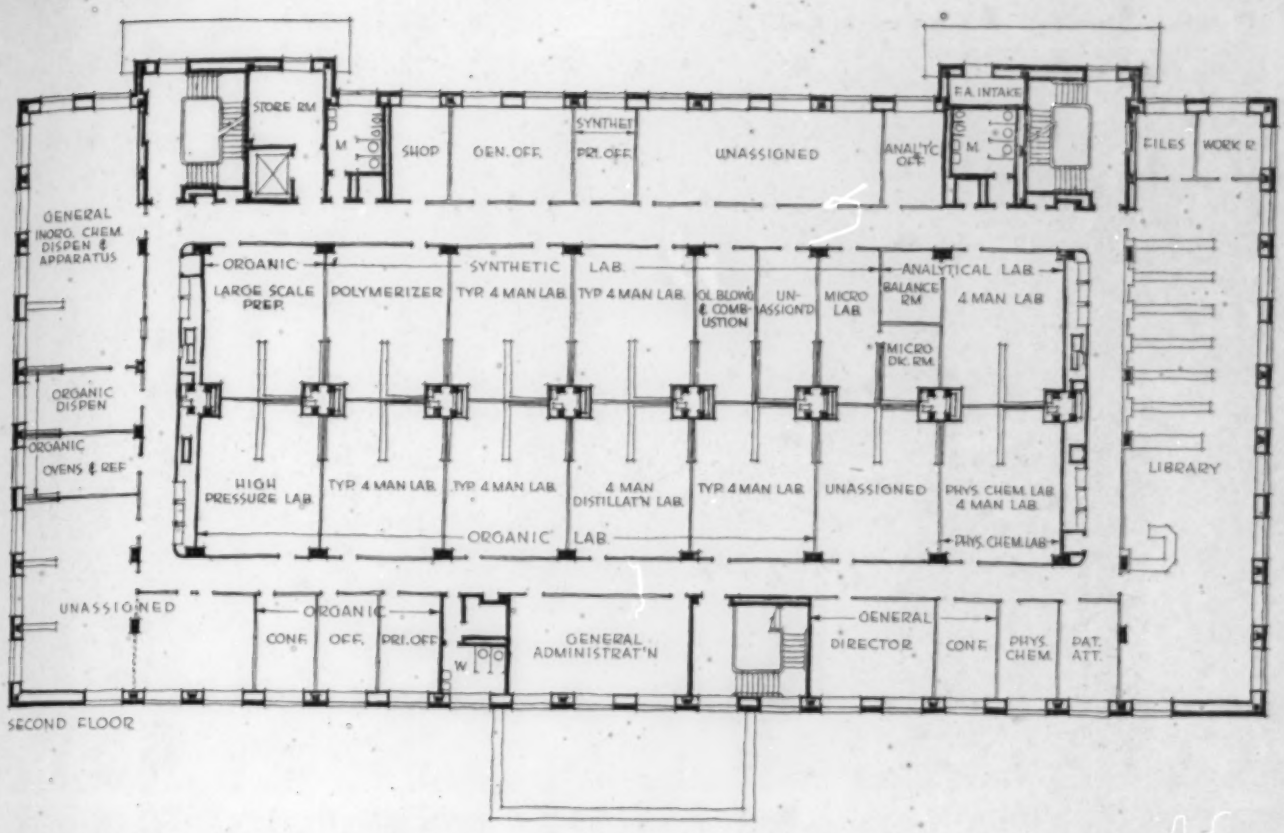
The service lines for a typical four-man one-bay laboratory are detailed in the Time-Saver Standards, pp. 143 and 145.

Still another factor in the flexibility of the service arrangements is the scheme of terminating most pipes, not in the laboratory tables themselves, but in narrow shelf-like cabinets. These run along the walls, here measuring only 6 in. wide, with tiny cup drains under faucets. All piping runs in the narrow cabinet below; wiring comes out in demountable troughs above the shelves. A similar system is worked out for island positions, the shelf cabinet running between laboratory tables. In some, where larger sinks are required, it is necessary to connect drains to the tables.

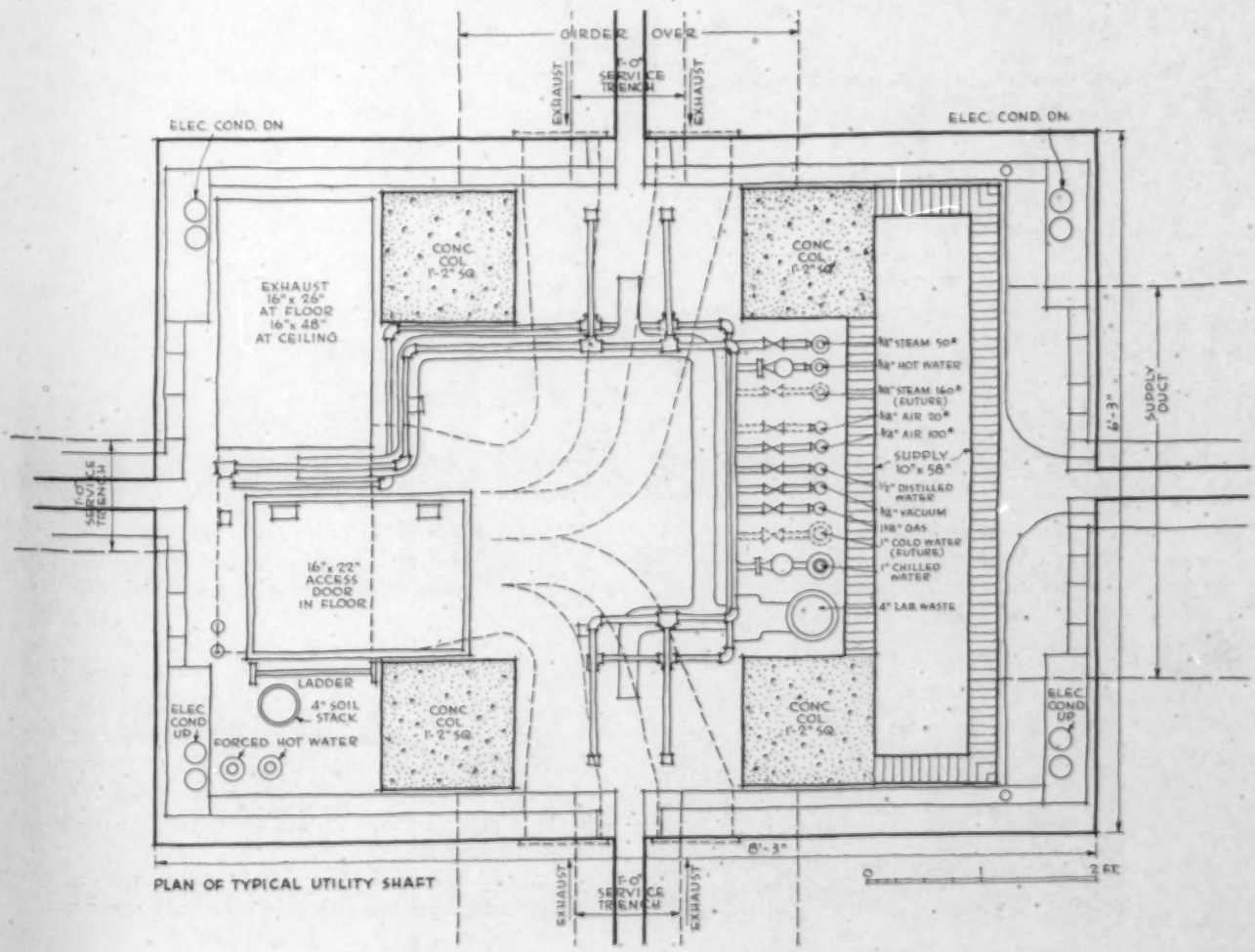
These narrow cabinets have demountable covers, like the electric conduit troughs. Incidentally,





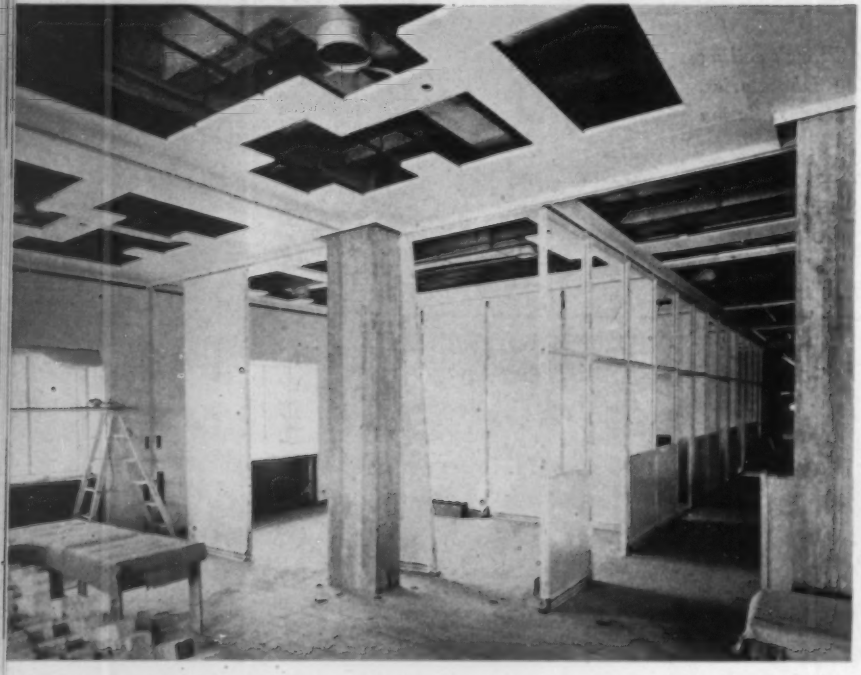


Opposite page, above: Air conditioning supply feeds through ceiling ducts from center to outside offices and to inside laboratories. Bottom, opposite: pipe shaft before and after partition installation



Recessed fluorescent light troffers and acoustic steel ceiling tile are arranged on a 1-ft. module, the width of the tile, for interchangeability

Prefabricated steel interior system includes rounded corner at corridor intersections, also clothes closets and borrowed lights in corridors



Construction view at start of installation of prefabricated interior. Ceiling and wall channels are installed in advance to accurate measurements

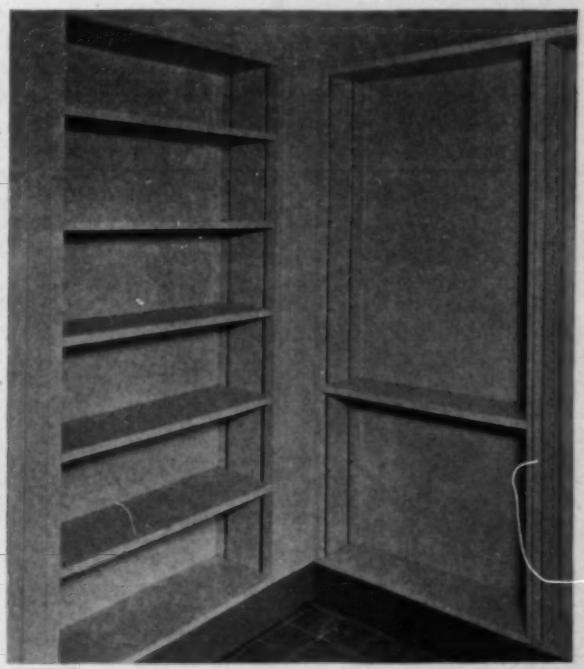
Installing pier and window embrasure. Deep window recesses and inset interior wall leave plenty of room behind for heat and utility pipes

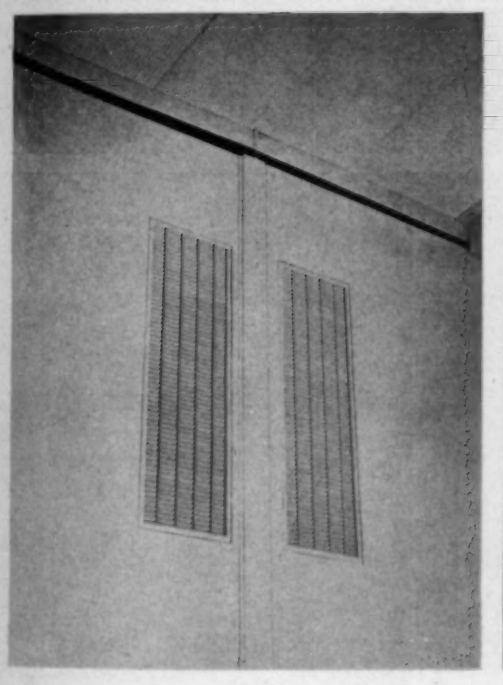
the wall prefabrication system is worked out to make it possible to support piping and troughs on the partition channel posts. By snapping off the post cap it is possible to slip a pipe hangar, with a stiffener strip, at almost any location (see photographs).

Similarly it is possible to change wall panels to accommodate a considerable variety of laboratory appurtenances. Fume hoods may be attached to panels at the columns,

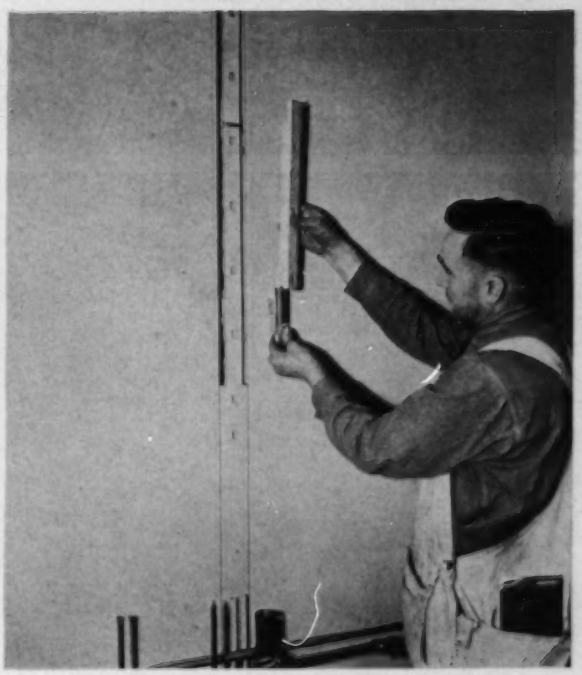
Demonstrating emergency escape hatch in walls between laboratory rooms. One quick blow of a fist and the panel drops down to permit escape

The steel interior system was used even in the library. Here book shelves of steel are recessed in the wall, are adjustable on vertical strips





Ventilating grilles in the partitions enclosing utility shafts permit direct exhaust from offices, corridors and laboratories through the shafts

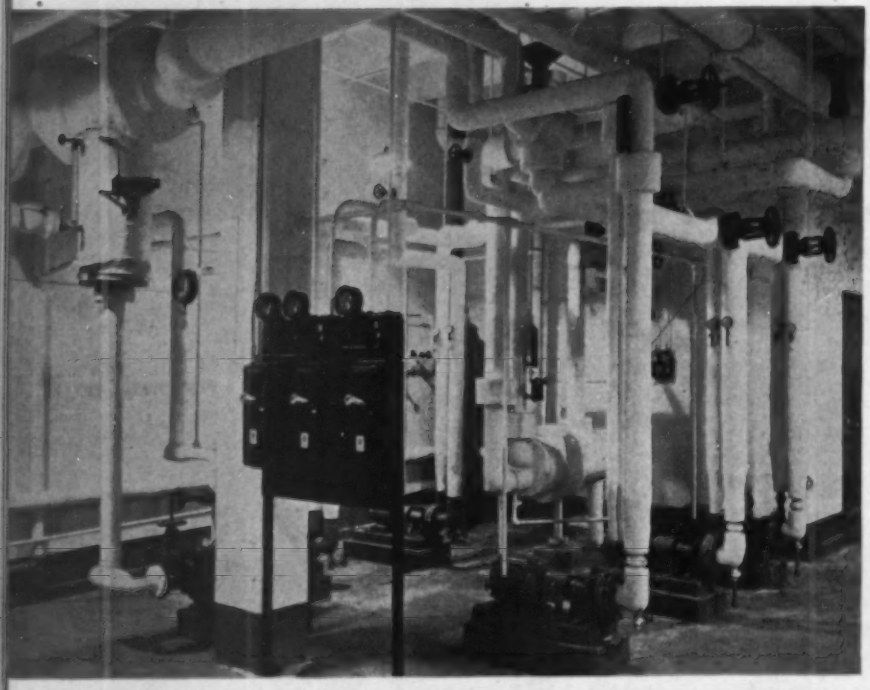


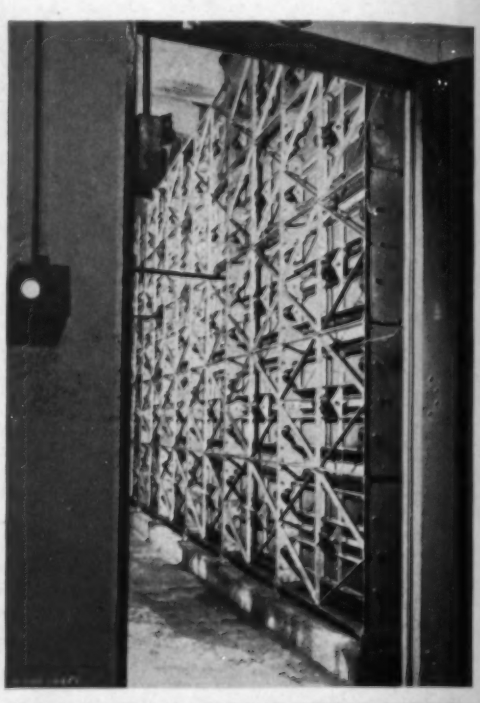
Pipes can be hung on partition supports by simply snapping off post cap strips, inserting a stiffener piece and dropping in a pipe support

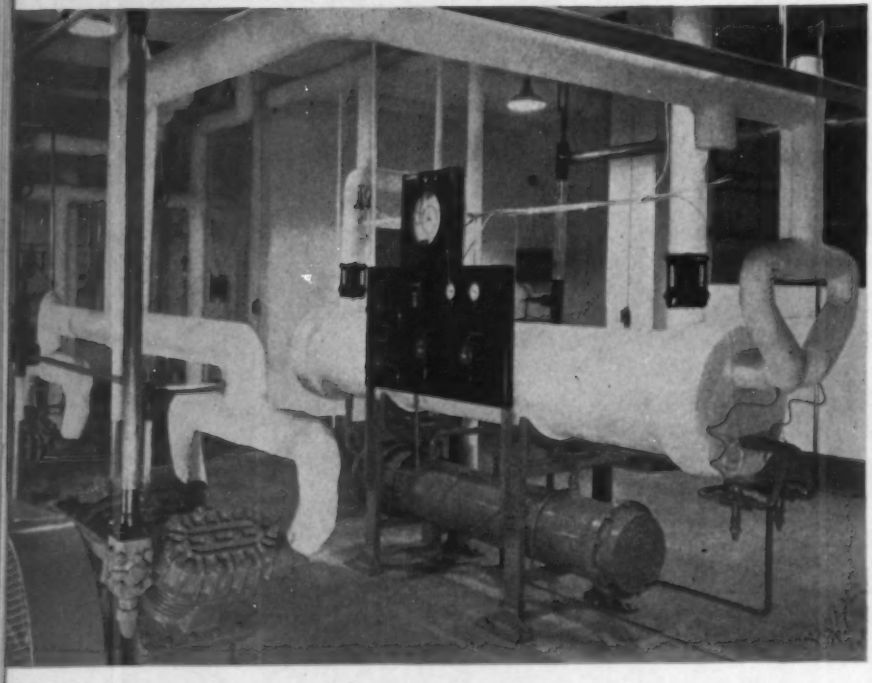
where exhaust ducts are located. Normally there are louvered openings here for the exhausts. There are also escape hatches in partitions between laboratories, so that in case of fire or other accident a worker may find exit through the walls. The hatch panel opens by dropping down into the partition; one blow with a fist on the knob opens the panel.

The building is completely air conditioned through a unique system, which completely exhausts all air; none of it is recirculated. Circulation is from the outside of the building toward the center pipe shafts, where air is exhausted to the roof. Clean air is supplied, at ceiling openings, both to the offices and to the laboratories. All office and corridor doors are louvered to allow exhaust to pass through. Thus the route is to offices, across corridors, through laboratories, to shafts. No air from laboratories

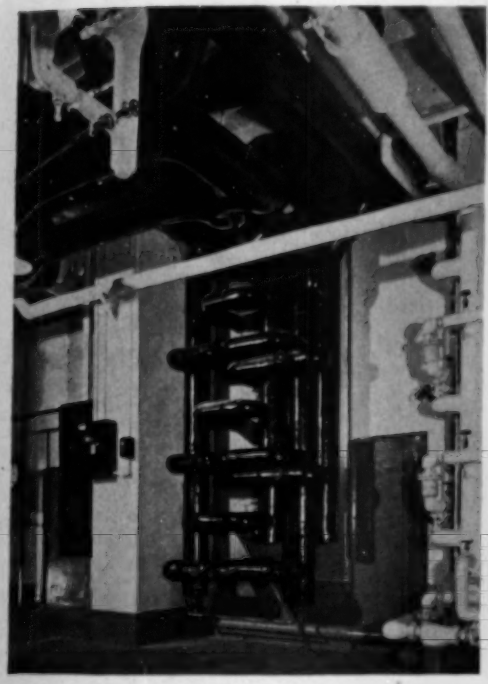
Views of air conditioning installation at the Firestone Laboratory, which is operated without any recirculation of air; Meyer, Strong & Jones, consulting engineers. In these views, the hot water converter for heating, with five circulating pumps; electrostatic air filter; the cooling system for drinking water; and the sprays in the dehumidifier

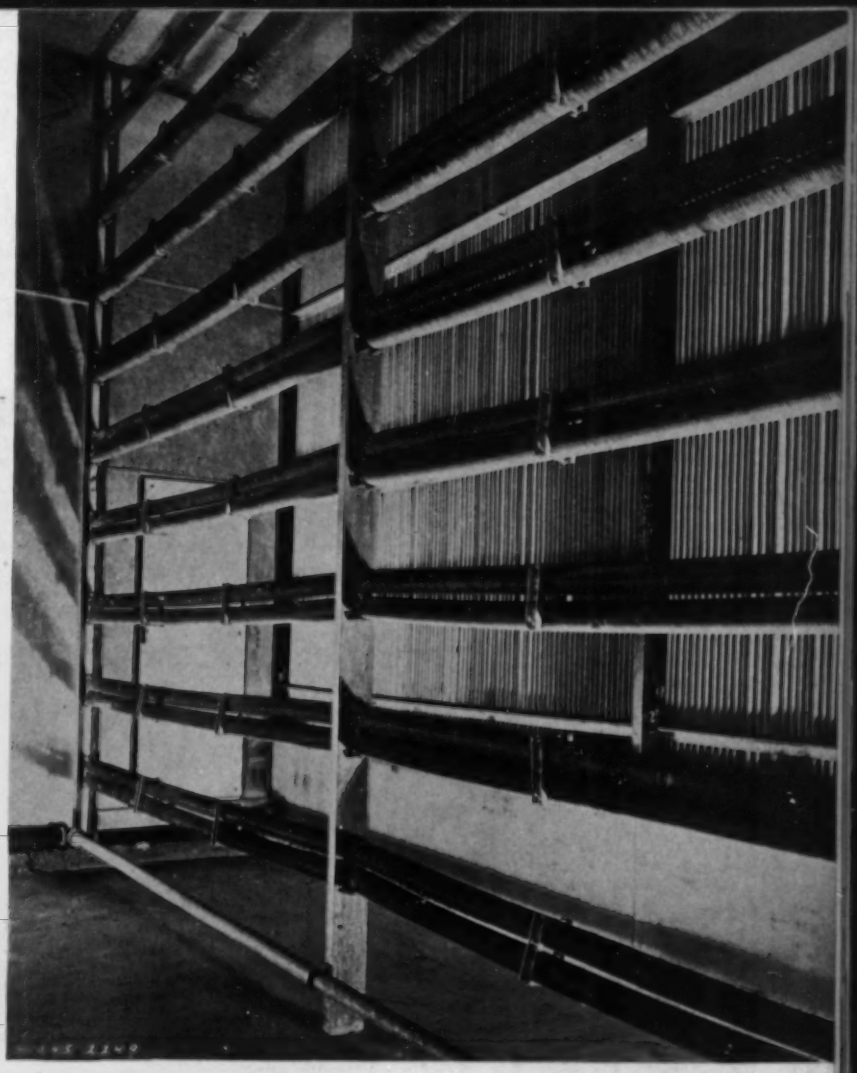


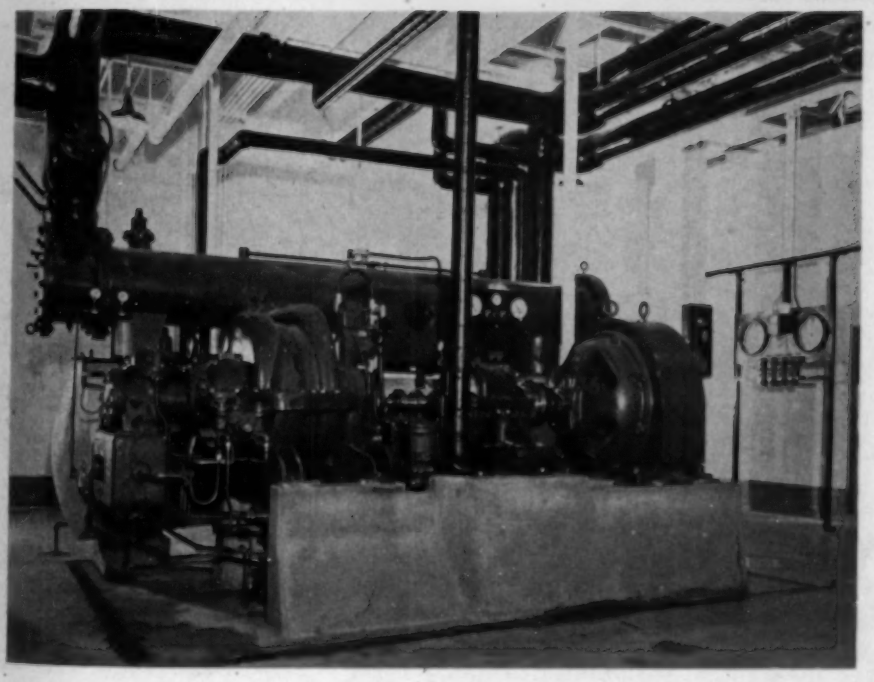




Chilled water supply piping for air conditioning system; the reheater coils for heating the dehumidified air; and compressor for refrigerating







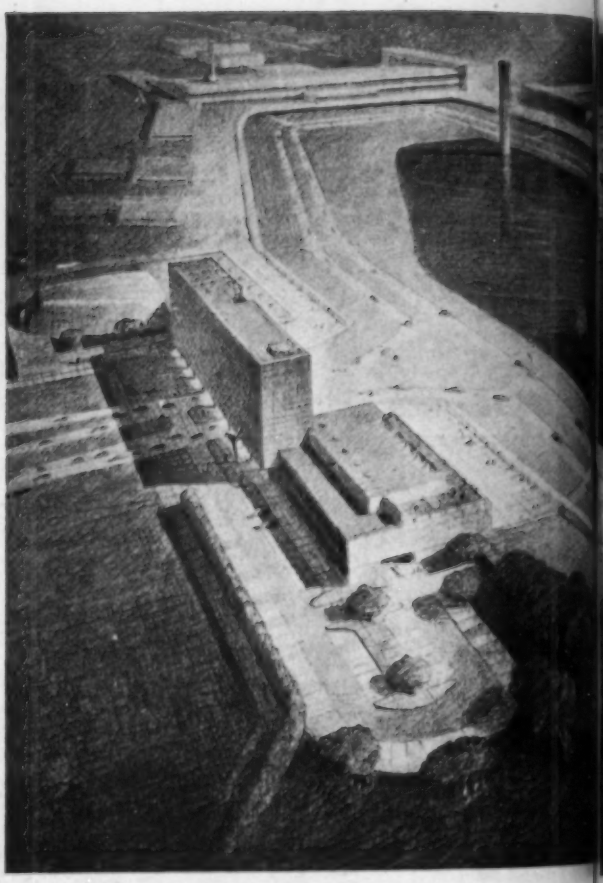
can get out to corridors or offices or other public spaces.

Air conditioning was, of course, one reason for locating laboratories in central space—it is more readily possible to keep exact control of temperatures and humidity, as might be required for certain laboratories. All supplied air is cleaned by electrostatic air filters.

Obviously such a laboratory is not judged on a cubic-foot-cost basis. Its very real economy is in its functional efficiency and flexibility. It is designed to provide every possible facility, every safeguard to equipment and personnel, every possible provision against obsolescence in a building devoted to making things obsolete.

GENERAL MOTORS TECHNICAL

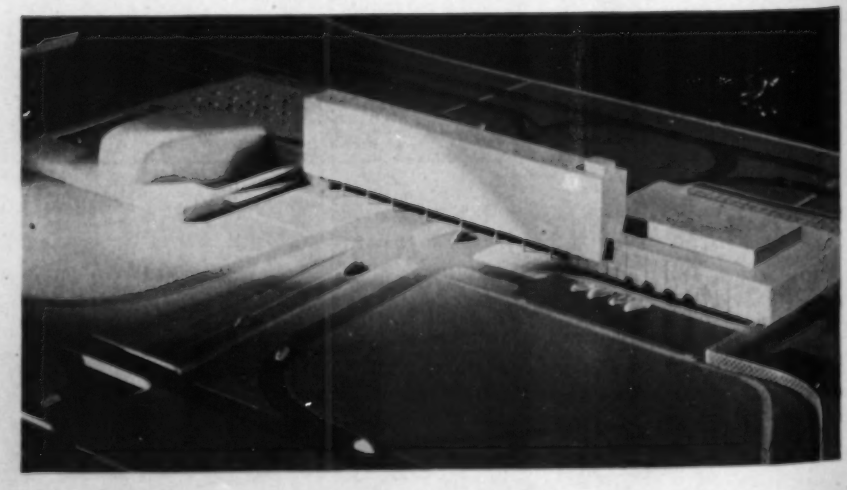
TO UNITE SCIENCE WITH ITS



Saarinen & Swanson, Architects

Thomas Church, Landscape Architect

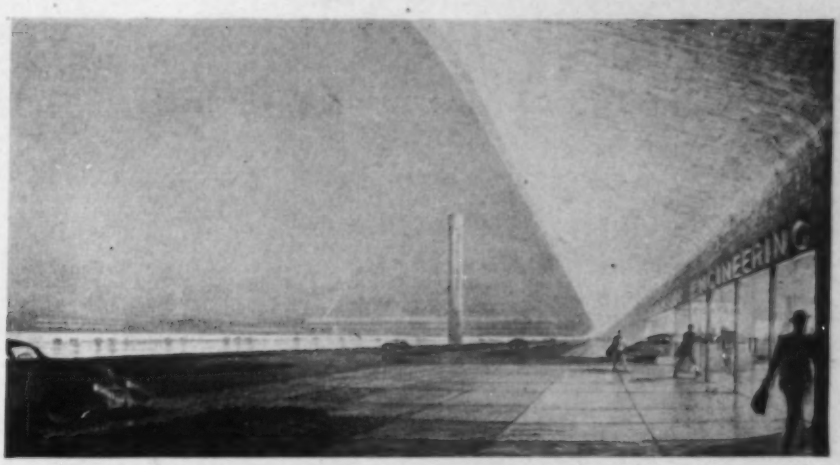
Renderings by Hugh Ferriss

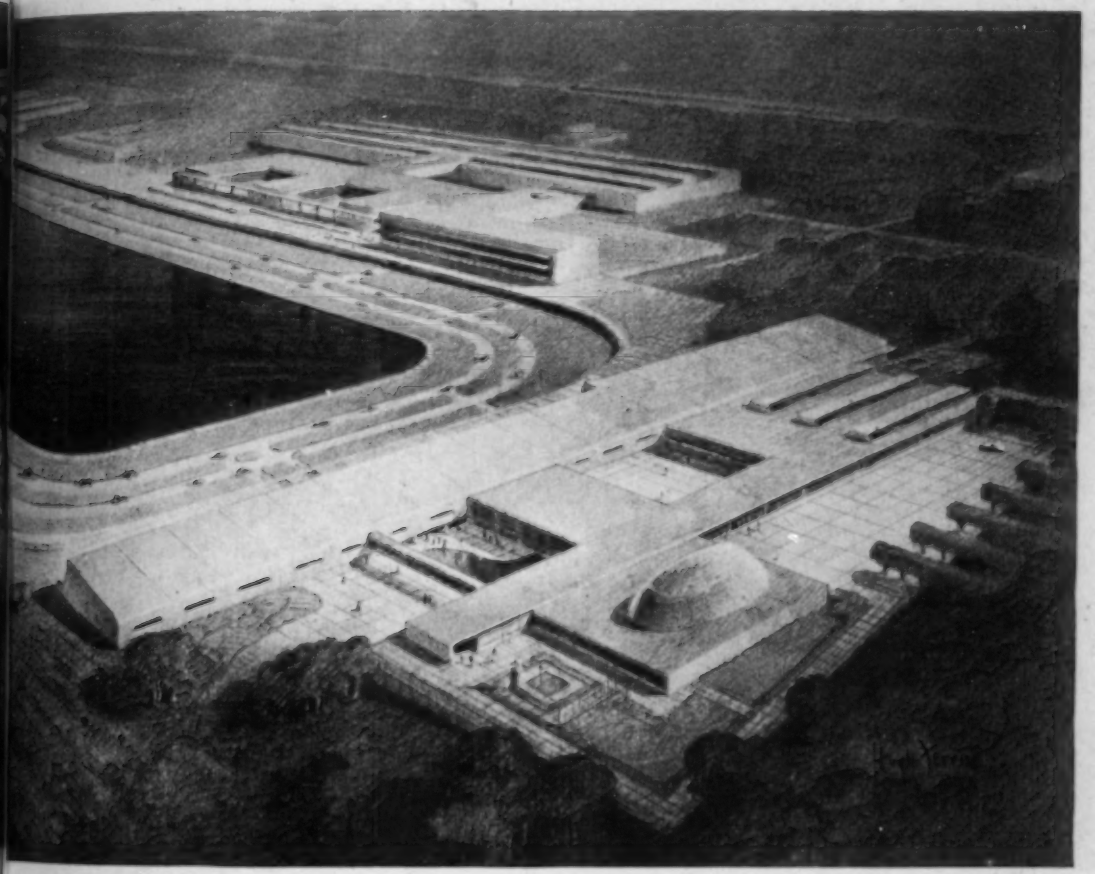


In the large rendering: at the left, Administration Building; lower right, Styling Section; above right, Advanced Engineering Section; top center, Process Development Building; at far end of lake, Research Laboratories

CENTER

APPLICATION





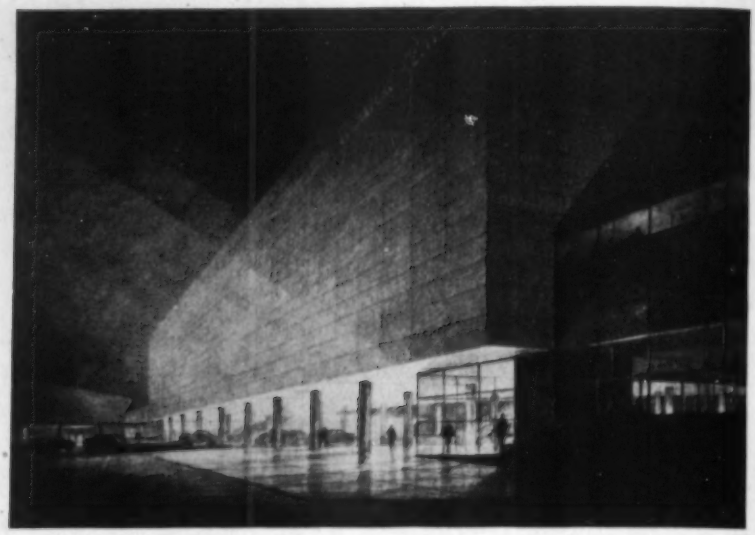
THE much-heralded World of Tomorrow seems a bit less ephemeral with this vision of what one corporation promises in the way of research. In announcing its proposed Technical Center, General Motors cites modern science as the "real source of economic progress and the creator of a higher standard of living." And the obviously whopping investment here represented is a pretty clear rejection of any idea that mere wishing will make it so.

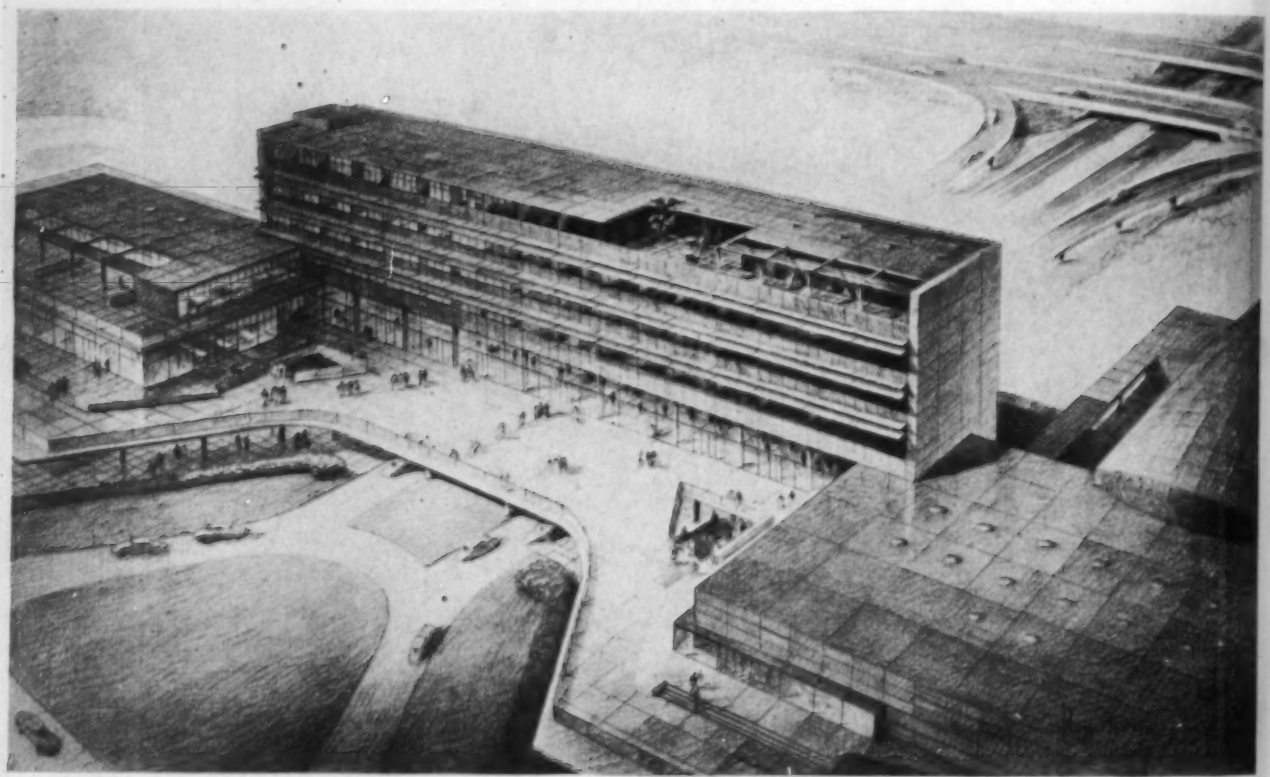
This group of buildings, on a 350-acre site near Detroit, is designed to bring together the research and experimental facilities of the corporation, to bring about both a more rapid interchange of ideas and a closer contact between pure science and practical application.

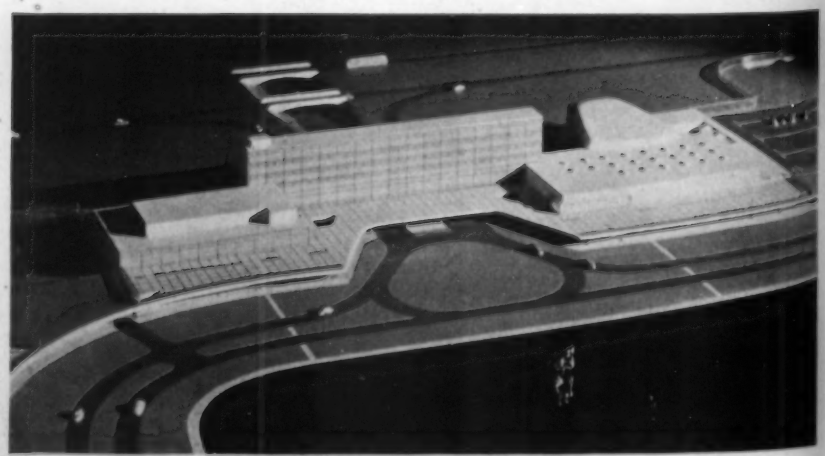
For all its size and scope, the Technical Center is not intended to supplant, but only to supplement, the product research and engineering departments of the various corporation divisions, which will continue to bear the responsibility for their own products. The Center will represent a purely fact finding and experimental activity.

Besides the Administration Building group, there will be four rather distinct

Administration Building







The terrace along the whole 1000-ft. front of the Administration Building will provide covered area for parking, also will give easy access to all parts of the building, not to mention its architectural and recreational value

sections in the Center: Research Laboratory, Advanced Engineering Section, Styling Section and Process Development Section. The Center is so planned that additions can be made to any section.

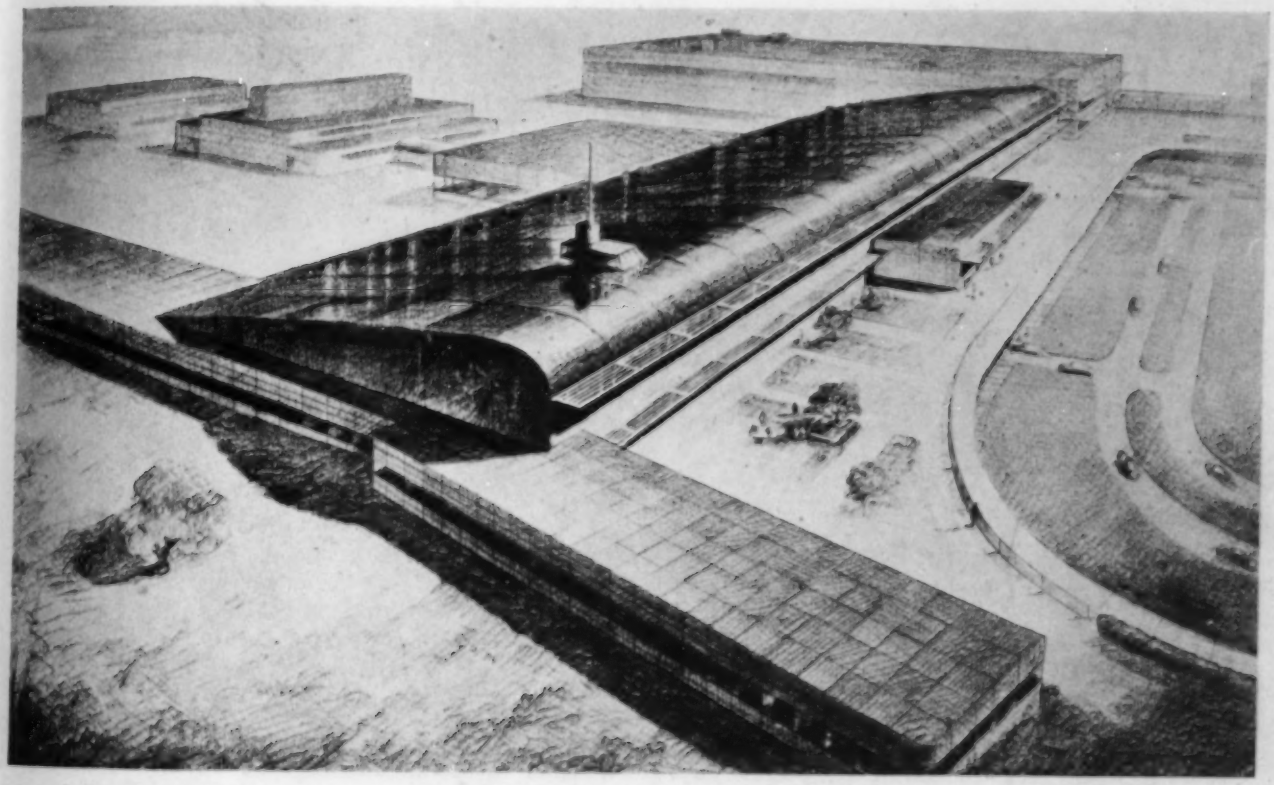
The several buildings comprising the center will be grouped around a central esplanade surrounding a 7-acre lake. Incidentally, while the lake may be scenic it will also be functional, being a cooling pond for the water of the air conditioning system. The property is about a half mile wide and a mile and a half long.

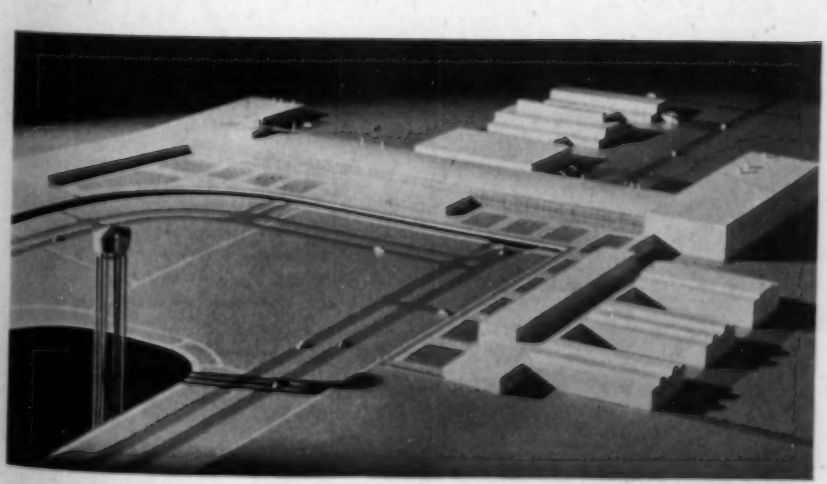
The layout of buildings and roadways will represent General Motors' latest thinking in area planning and traffic control. Such problems as parking, traffic flow and street intersection separation have obviously been considered as major design factors.

The parti calls for a terrace on which the buildings will be set, to provide ground level drive-ins, the lake excavation supplying the necessary fill.

The Administration Building will have a frontage of approximately 1,000 ft., and will serve—beyond its normal purposes as the administrative center—as a huge exhibition hall for company products and new developments. There will be an auditorium seating 1200 persons, fully equipped for stage or screen pre-

Research Laboratories





One of the largest of the individual sections, the Research Laboratories will occupy the group of buildings at the north end of the 7-acre lake. It will house research groups now at the General Motors Building in Detroit

sentations. While of course it will serve for a variety of meetings, an especially important one would be a gathering of divisional dealers at the time of new model announcements.

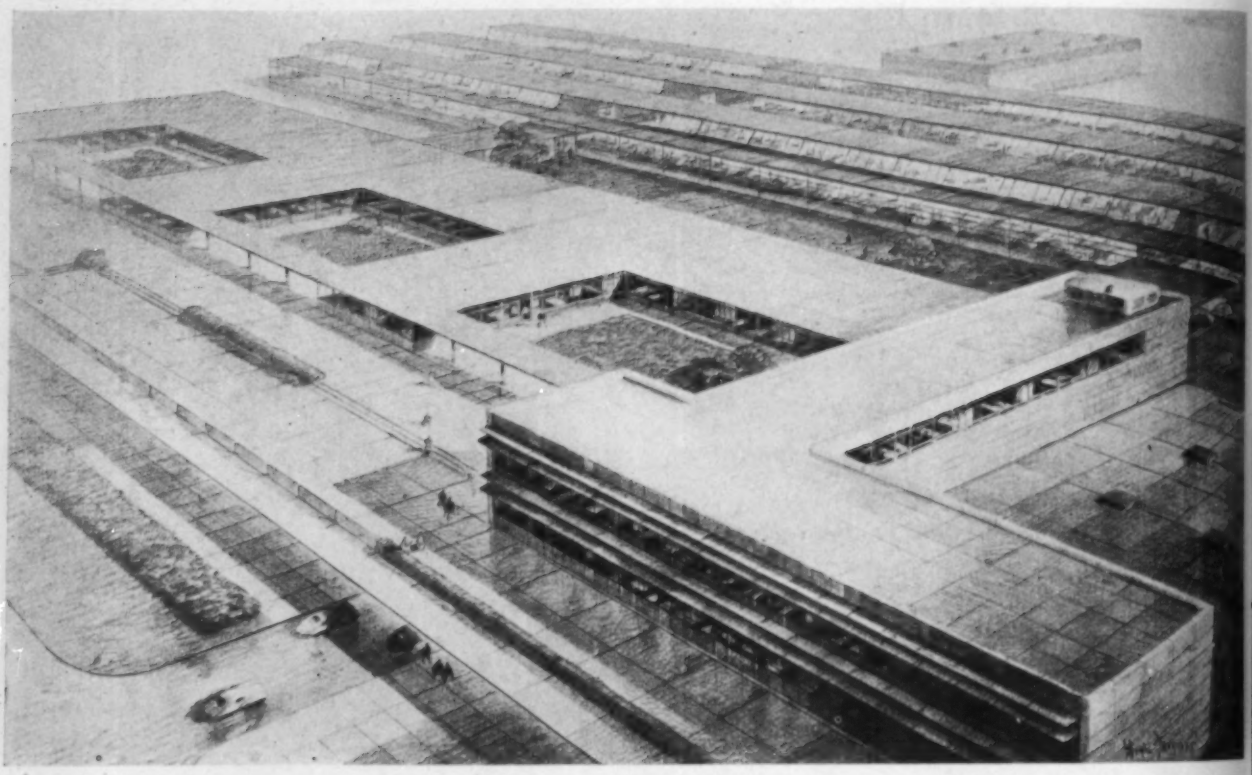
The Advanced Engineering Building will provide facilities for special products studies including: car development, car suspension, and structures, transmission or engine development.

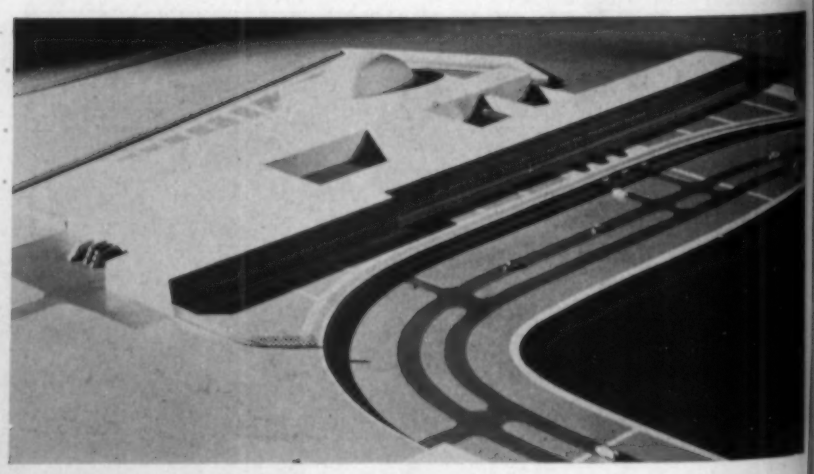
The Advanced Engineering building will have a frontage of 680 ft., facing the lake. There will be two floor levels, with the upper floor providing approximately 80,000 sq. ft. of space for the engineering and drafting facilities of the various Products Studies Groups.

Advanced Engineering Building

The Research Laboratories building will be at the north end of the property. This will be one of the largest buildings in the group and will house all the facilities now located in the Research Laboratories Building adjoining the General Motors Building in Detroit. The Detroit building will be taken over by other units of the corporation as quickly as the research group is established in the new Technical Center.

The Styling Section Building will be situated at the southern end of the esplanade, facing north to obtain best advantage of the north light. The build-





Here science and its applications are to be brought together. The covered walk at the overhang of the terrace extends around the entire central esplanade, joining the buildings all of the way around the lake

ing will have a frontage of approximately 850 ft. with a width of 250 ft..

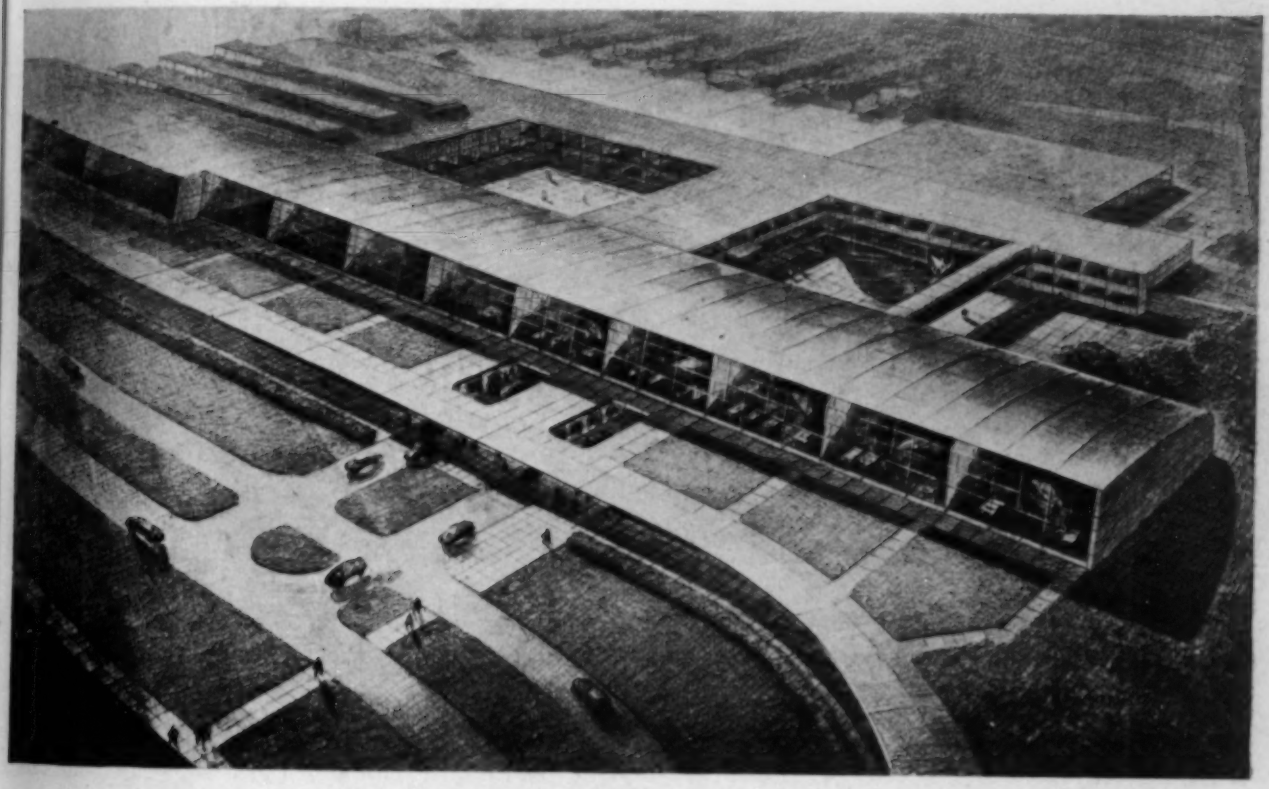
Main floor of the building will be divided into individual design studios measuring 50 by 70 ft., each of which will be fully equipped with facilities to design full-scale models of all projects under development.

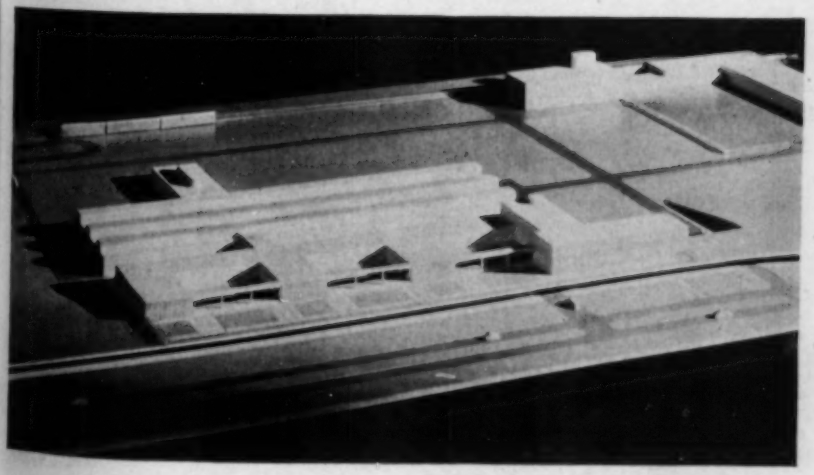
The ground floor of this as well as the other buildings will provide ample under-cover parking space for employees' cars so that they may drive directly into the building from the esplanade, park their cars and proceed to their work.

The Process Development building will be adjacent to the Research Laboratories building. It will provide complete facilities for the study and development of production processes and techniques and the practical application of new techniques to actual production. Process Development in a sense rounds out the cycle of research, engineering and design, since it will directly aid manufacturing divisions in perfecting production processes.

What it all will cost, if any real estimate has been made, is not being told. That it will amount to a sizeable sum is perfectly obvious. General Motors points out that the Center represents an entirely new concept of industrial research, and that is the basis on which the proposal will be judged.

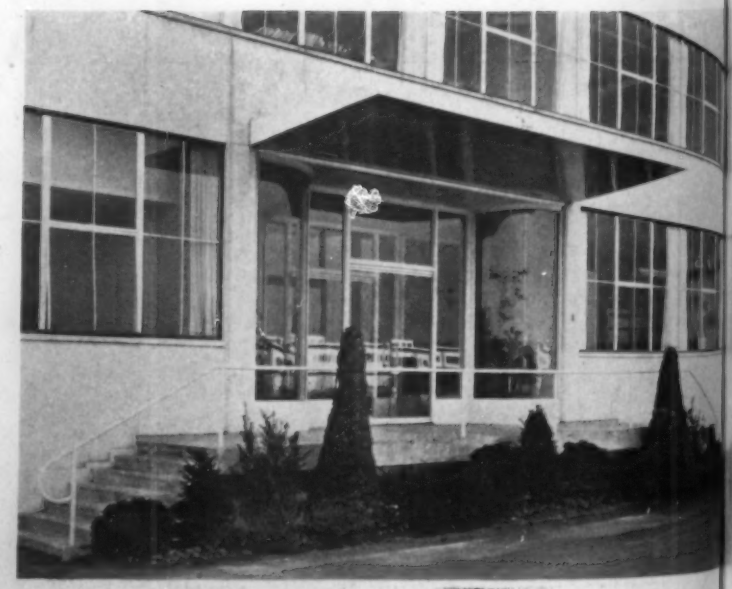
Styling Section Building





The Styling Section Building is placed at south end of lake to give good north light to design studios. The long front will house a series of individual studios, each measuring approximately 50 ft. long by 70 ft. deep

RESEARCH LABORATORY FOR



General view of the building from the south showing the simple clean lines of the design. The large window areas are provided with draw curtains of glass fabric. Right: The inviting entrance to the main lobby on the north side has curved plant windows at both sides

Gottscho-Schleisner photos

HOFFMANN-LA ROCHE INC., NUTLEY, N. J.

Fellheimer & Wagner, Architects

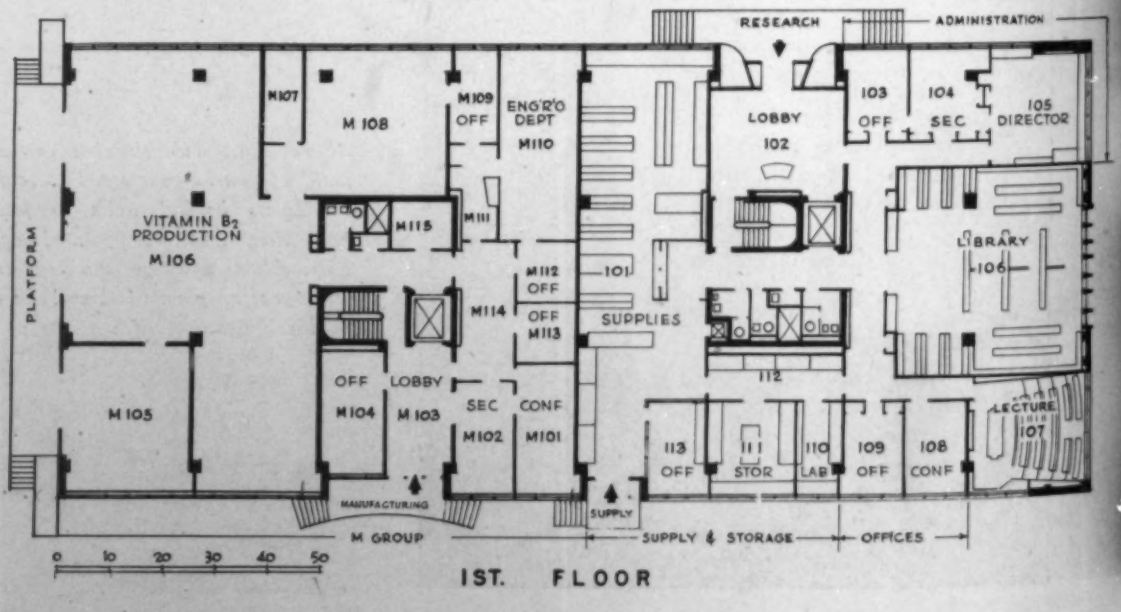
THIS research laboratory, is, of course, but one building of a large group, a highly specialized building for creative work. It provides both the facilities and environment for an integrated group of scientific specialists. Their work includes basic pure research in the fields of organic chemistry, pharmacology, chemo-therapy, biology, micro-biology, medicine, nutrition, etc. Their activities range from pure research to the development of marketable pharmaceutical preparations and their control and testing.

Careful study of the plans shows an efficient arrangement of areas and facilities with the various functions grouped in natural proximities. There is convenient access to the facilities used in common, such as library, supplies, lecture and conference rooms. The main fields of activity for each of the laboratories are indicated on the plans.

The architects not only planned and designed the building, but also designed the furniture, the equipment and the interior accessories.

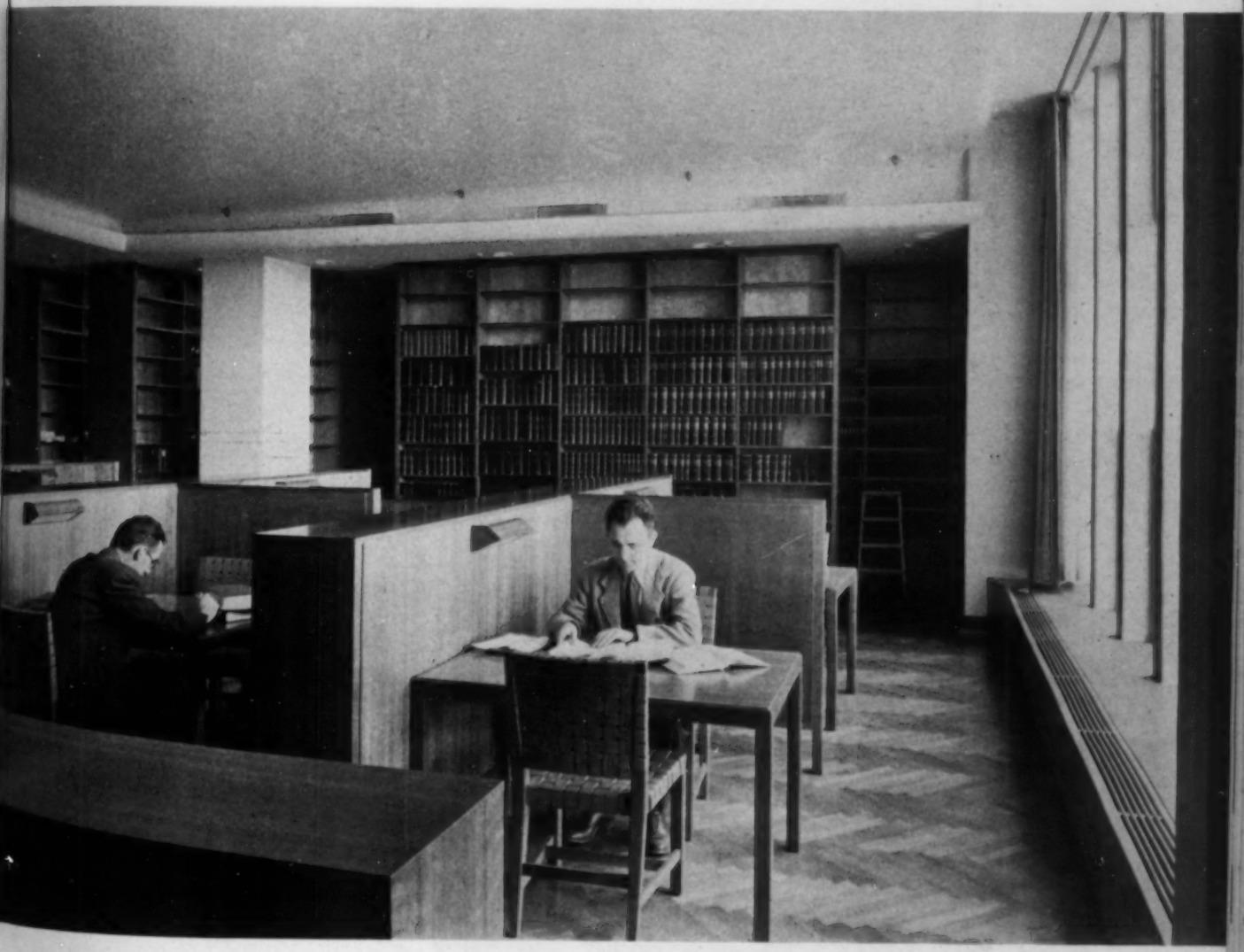
Above: East end, showing vertical-rib central motif of poured concrete. Flat roof construction cantilevers beyond walls to form protecting projection, underside painted eggshell white. Left: Main entrance showing ventilated and water-proofed plant windows. The lobby floor is of black terrazzo, with joints of white plastic

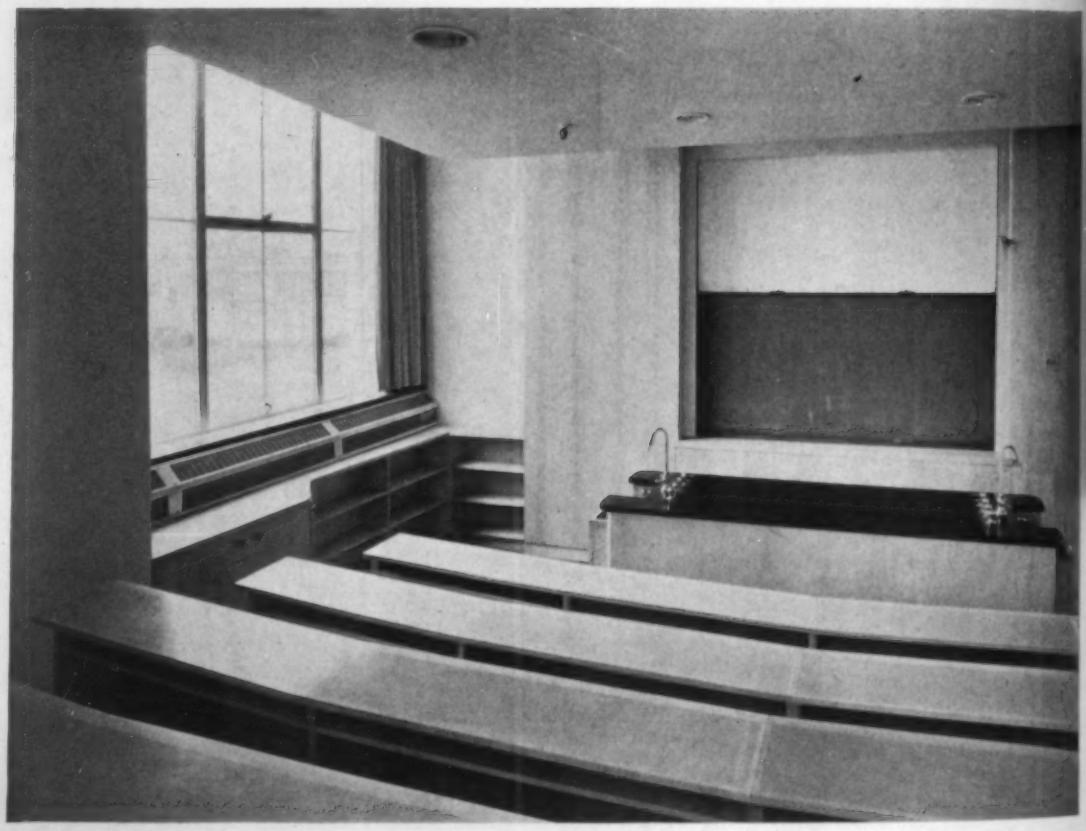
Above: Office of the Director of Research. General lighting by recessed fixtures in hung ceiling. Furniture designed by the architects in walnut, with light brown leather upholstery; walls egg-shell stipple, carpet light beige. Left: A group chief's office with natural light maple furniture. First floor plan, showing efficient, convenient arrangements of function. Basement and sub-basement below provide facilities used in common, such as glass blowing, glass washing, autoclave, fermentation, cold rooms, large scale, constant temperature and constant humidity rooms, plus mechanical equipment, locker rooms, storage, etc.



Laboratories and major rooms occupy the entire perimeter, and are thus provided with a maximum of natural light. Elevators, stairs, toilets, storage, dark rooms, mechanical equipment, etc., are placed in the central core of the building where natural light is either unnecessary or undesirable. The building is functional in the best sense, in that it not only provides the necessary space and facilities conveniently arranged, but through its simplicity of design, its skillful use of materials and colors it provides a congenial environment conducive to efficient work. This is especially necessary where concentration and precision are the order of the day, and teamwork requires frequent consultation

The library, arranged for convenient active use. General illumination is indirect from a continuous cove, supplementary lighting is direct. Walls and ceiling are eggshell stipple; herringbone floor; furniture, paneling, adjustable shelving, and partitioning, are natural cherry; woven leather upholstery. Air conditioning outlets are concealed above the lighting cove



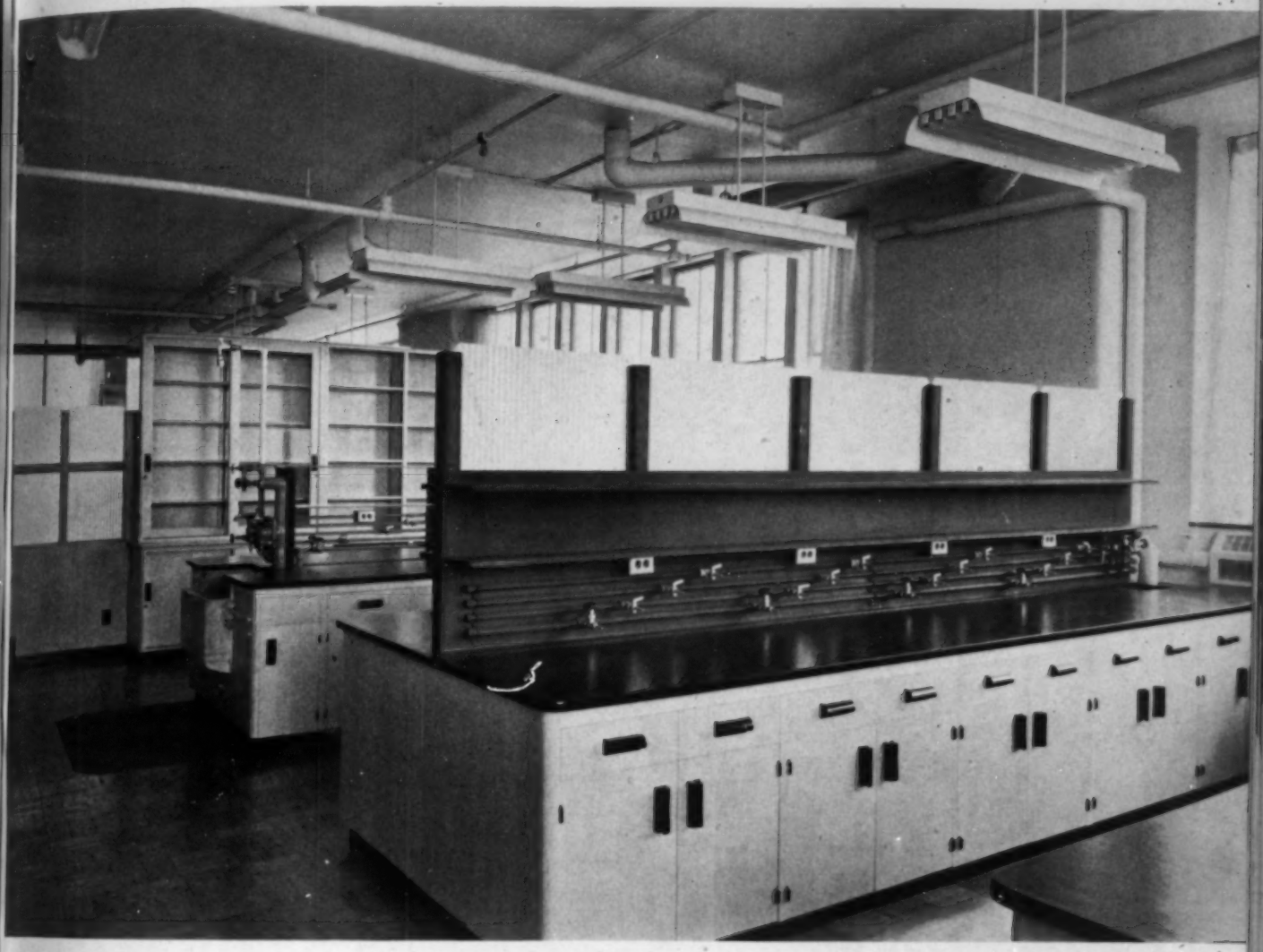


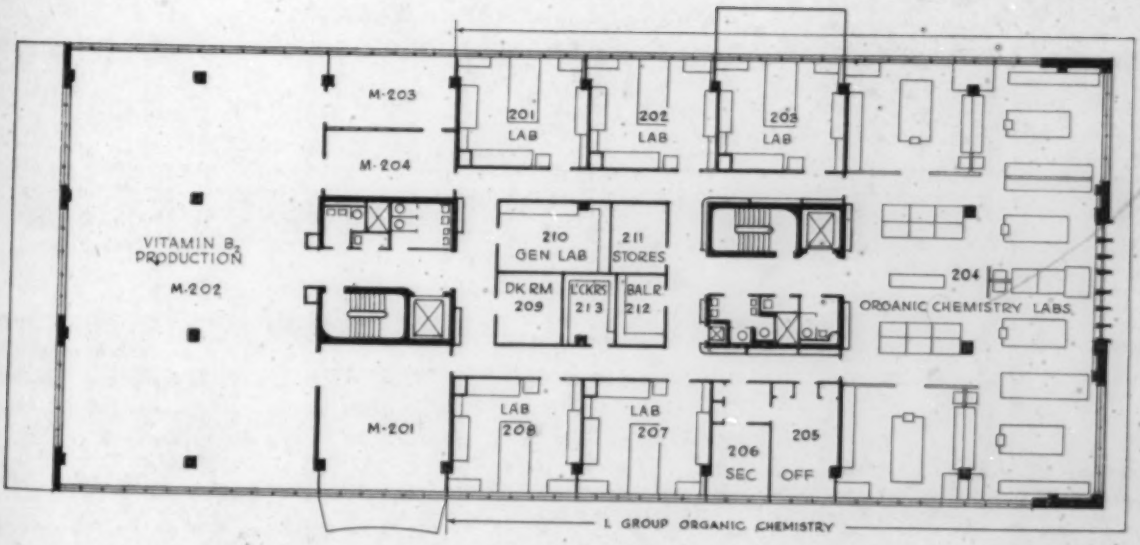
and the exchange of ideas.

Construction is of reinforced concrete, with a facing of precast stone squares. The building is air heated and has supplementary hot water radiation at window areas, locally controlled. Provisions for air conditioning are made in connection with the air heating and ventilating system. The lighting is carefully calculated and so placed as to give 35 foot-candle illumination at working levels. Every detail contributes to the effectiveness of research.

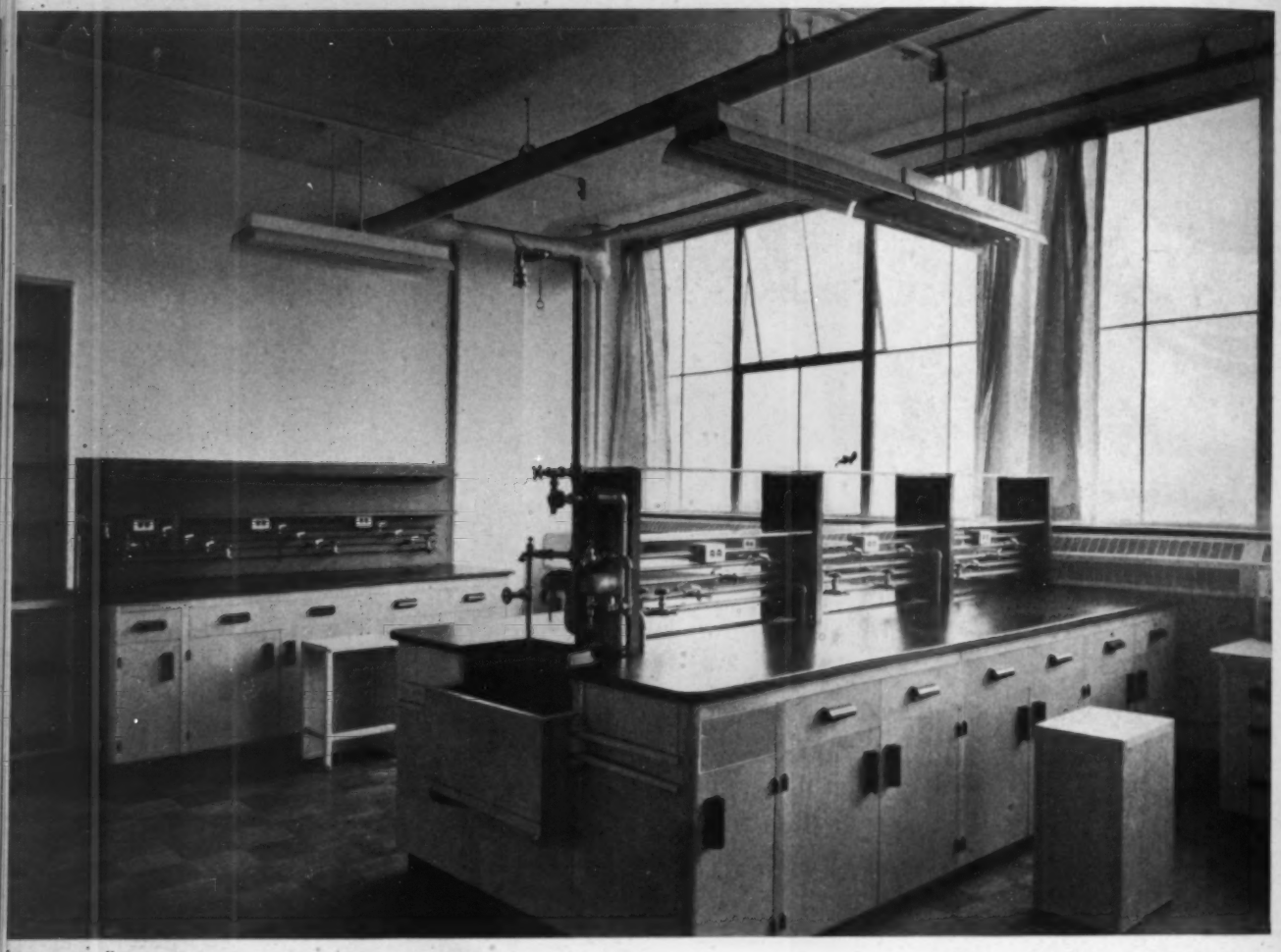
The lecture-demonstration room seats 50 to 60 spectators. Curtains are opaque-lined to darken room for projection. The demonstration table is completely equipped with gas, water, steam, vacuum, compressed air, electricity, and has all controls convenient to the lecturer. Concealed fluorescent lights are provided at the sides of the blackboard (which is lowered when matte white wall surface is desired for projection). Natural maple amphitheater seats and desks are provided with shelves. Storage cabinets and open shelves are also finished in natural maple

A typical general organic-chemistry laboratory (204). Laboratory tables and cabinets are of maple with acid-resisting plastic finish, rounded corners, black ebonite handles. Convenient exposed piping and outlets provide for gas, air vacuum, water, electricity, etc. Built-in laboratory sinks at island ends are equipped with steam, hot water mixer, safety shower, etc. Walls are white eggshell stipple; floors oak with acid-resisting finish. The third floor is similar in laboratory arrangement, but has pilot laboratories at west end instead of vitamin production

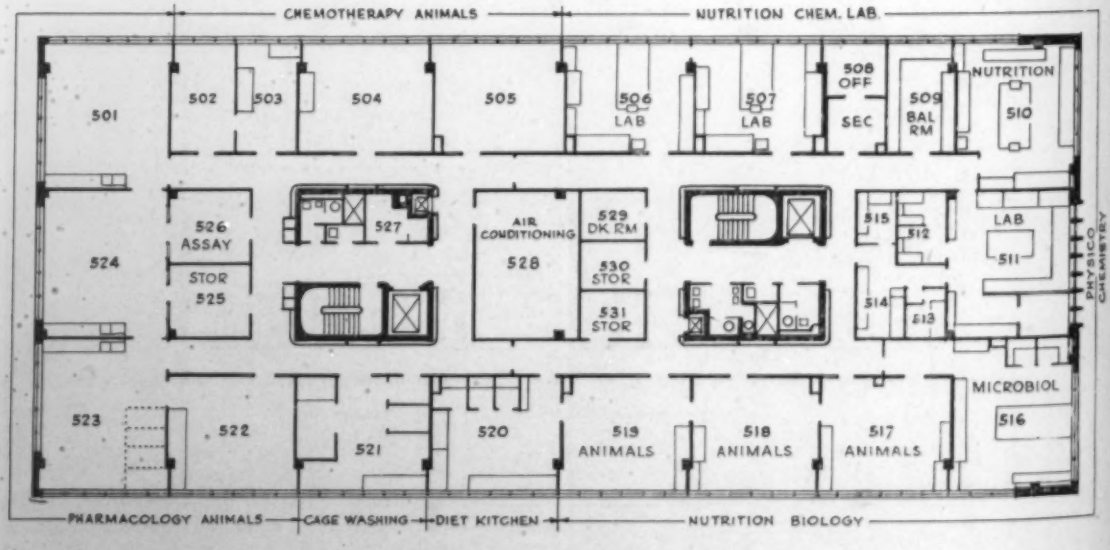




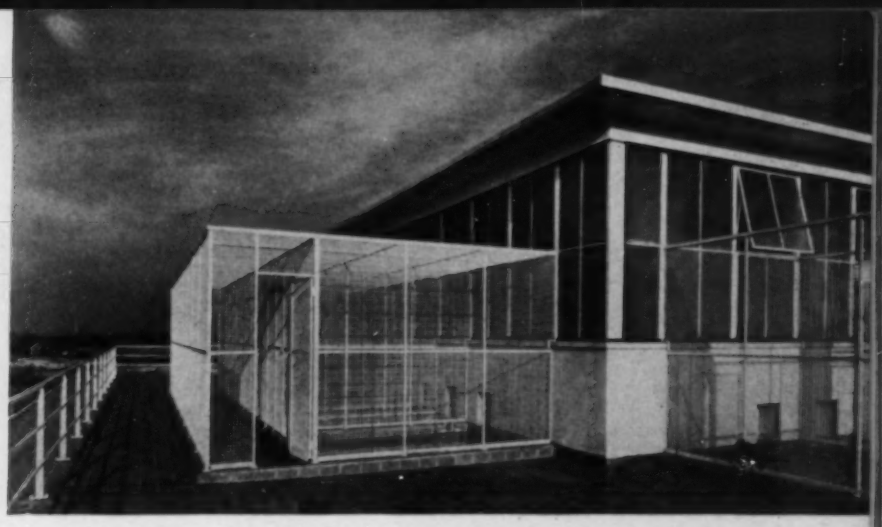
2ND. FLOOR



Typical single laboratory (506), equipped with center and side table having exposed piping, glass shelving, alberene gutter down center emptying into end sink. All sinks have safety showers, mixing valve for steam and water, water-vacuum pumps, etc. Corner cabinet for the waste receptacle has a push-in plastic cover. All curtains are of glass cloth. All walls are painted eggshell white. The fourth floor, not shown, is similar in plan to the fifth, but devoted to pharmacology, chemo-therapy, micro-biology, and pilot laboratories

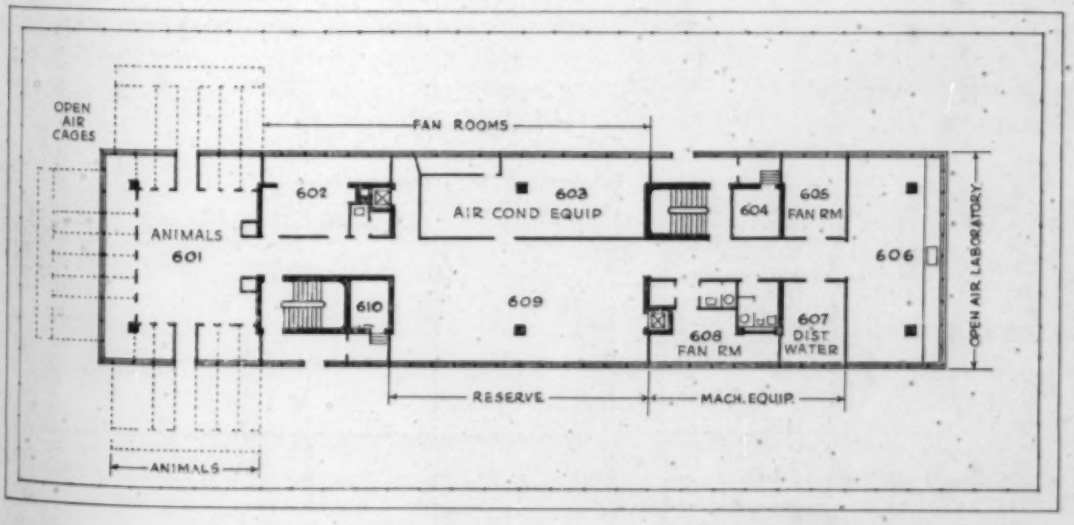


5TH. FLOOR



Movable animal cages are in gray-tiled, cove-based, sanitary rooms, with floor of beige terrazzo. Floor drains are provided. Air conditioning is a separate system, with temperature and humidity control for each room. Outdoor animal cages have remote-control sliding doors to inside portions

Laboratories in use. At extreme right, chemical hoods, each completely equipped with facilities controlled by outside valve handles. Separate exhaust fans are provided for each vertical shaft and have controls at hood face with switch and indicator lights. Vertical exhaust ducts are at inside corners of laboratories. Laboratories are ventilated through hoods, eight air changes per hour



PENT HOUSE FLOOR

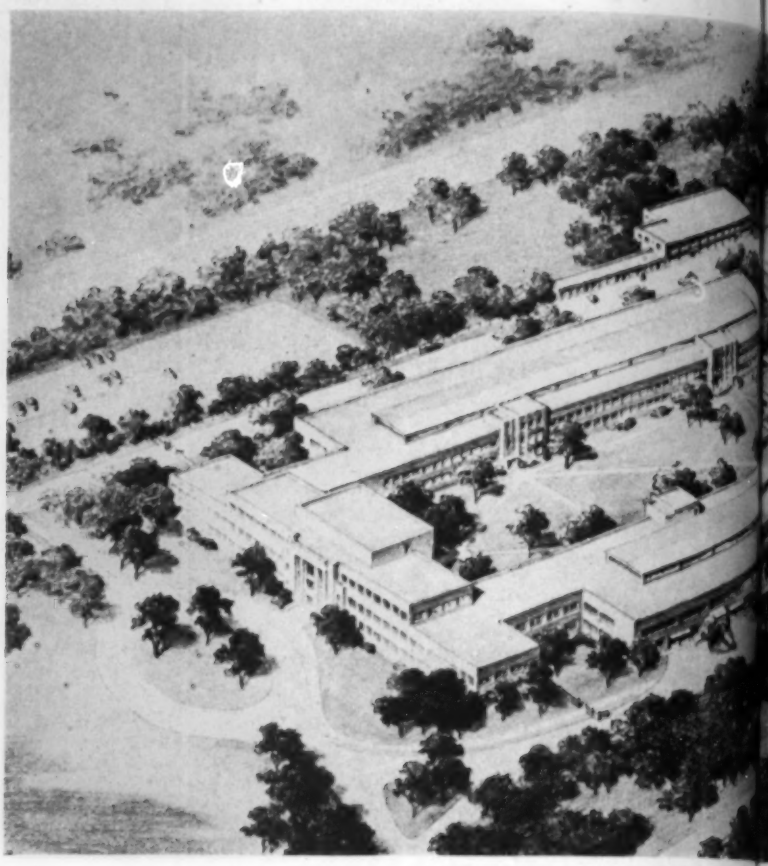
Johns-Manville Corp.

Research Center near

Bound Brook, N. J.

Shreve, Lamb, and Harmon

Architects

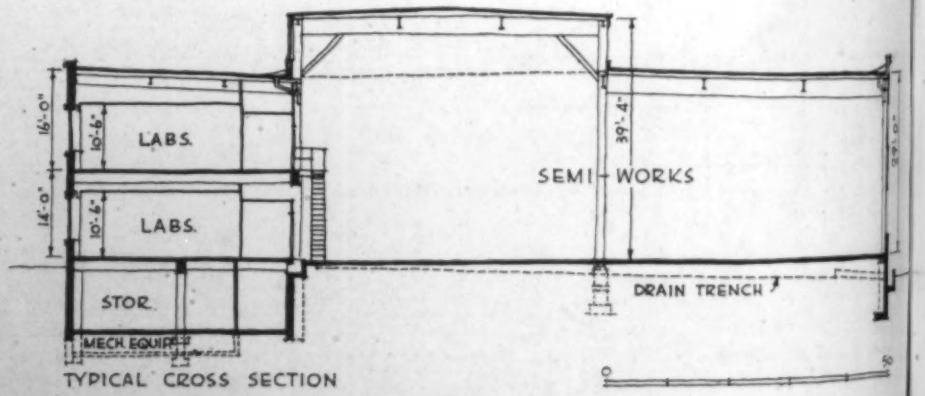


RESEARCH AND MANUFACTURE COMBINED

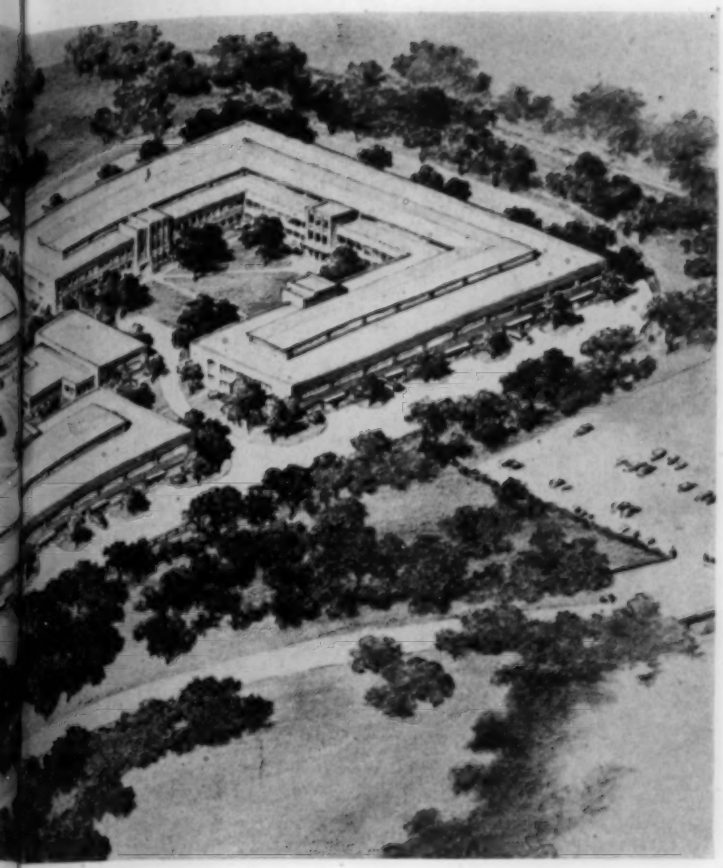
RESEARCH laboratories and experimental factories, with space requirements of distinctly different character, are to be housed under one roof in the new Johns-Manville Corp. Research Center. Working in the field of building materials, insulations, the laboratories needed single story, typical office-laboratory space for product research, the factories needed factory height and breadth for full scale experimental manufacturing and product testing. Getting this disparate team into double harness, coupling research and production in adjacent working space, was the architects' job.

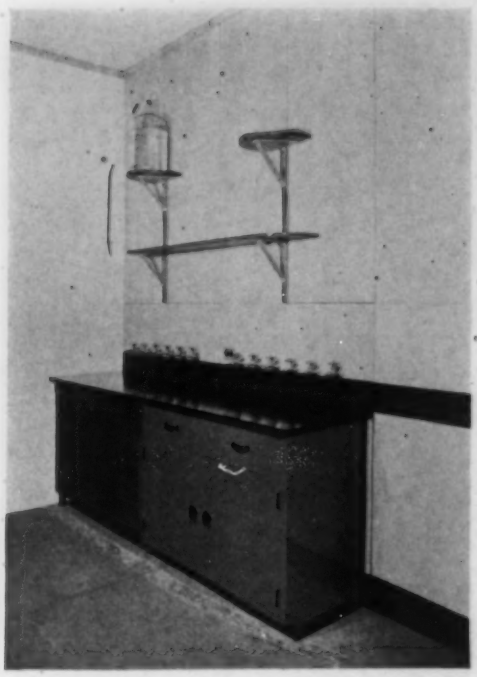
The two functions are combined smoothly in three long buildings which, connected by criss-cross paths in campus style, will eventually enclose three sides of a landscaped quadrangle; the outer half of these buildings will house experimental factories (ten in the first unit now under construction), the inner half will house research laboratories. Across the front of the quad will be an Administration Building with lounge, cafeteria, auditorium, and outdoor lunching facilities, in the center will be a Machine Shop, while a water filtration-waste processing plant and a garage will be at one side of the 93-acre plot.

Flexibility in plan and in structural materials used inside and out characterize the buildings; outer factory walls are of removable asbestos-cement panels for easy expansion or contraction of each factory unit; inner laboratory walls are movable partitions with built-in service outlets and channels for installing useful wall shelves.



TYPICAL CROSS SECTION



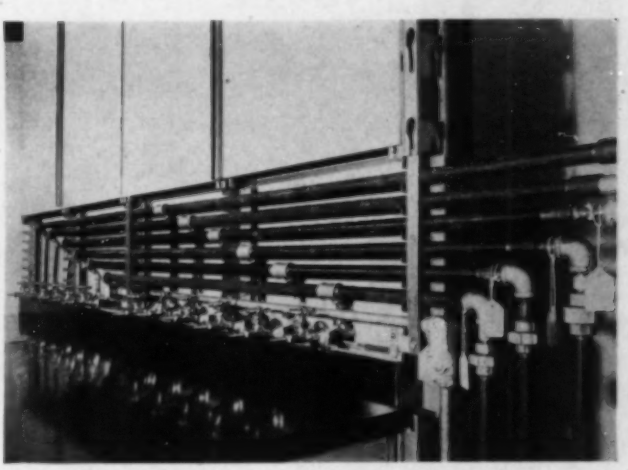


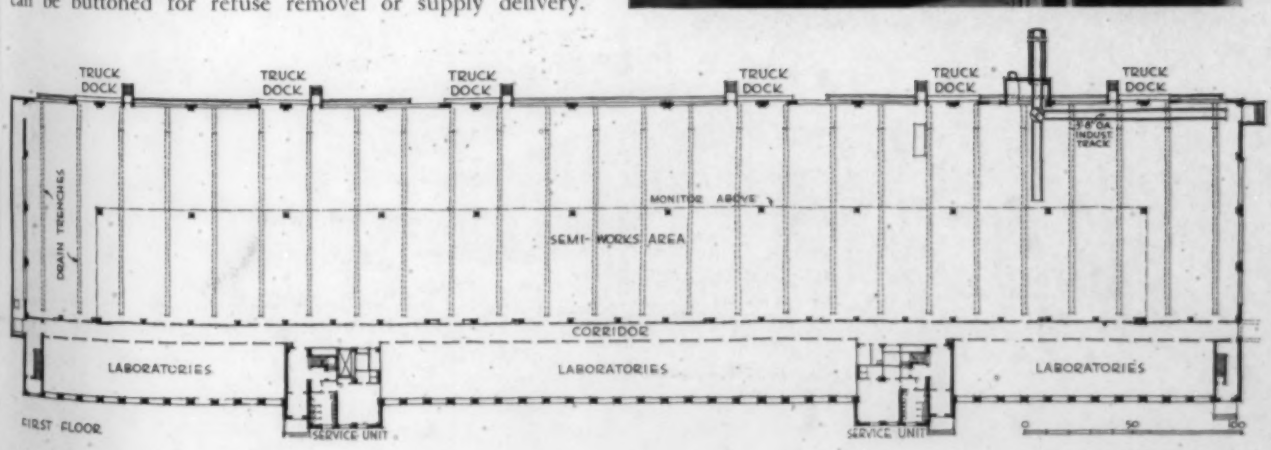
No shelf hanging problems, no dirt catching exposed pipes in projected research laboratories. Smooth surfaced, movable partitions include adjustable shelf supports, offer easy access to the concealed piping in the wall

UNDER ONE ROOF

Laboratories, which can be enlarged or reduced as needed, have escape doors, hallway showers for fire or acid explosions, air conditioning, and flush ceiling fluorescent lighting. Factories, air conditioned and humidified to suit testing requirements, are adaptable to varying space needs and will handle small or large scale tests. Quoting a company official, "one unit will be able to make a quick cycle test of the wear and tear building materials get in actual use. We will put an entire roof or side wall through 20 years of climatic changes in six months."

To maintain an orderly and sightly plant, trucking facilities will use an underground tunnel connecting all buildings, and factories will have doors on which trailers can be buttoned for refuse removel or supply delivery.





UNIVERSITY LAB

Georgia School of Technology

Atlanta, Georgia

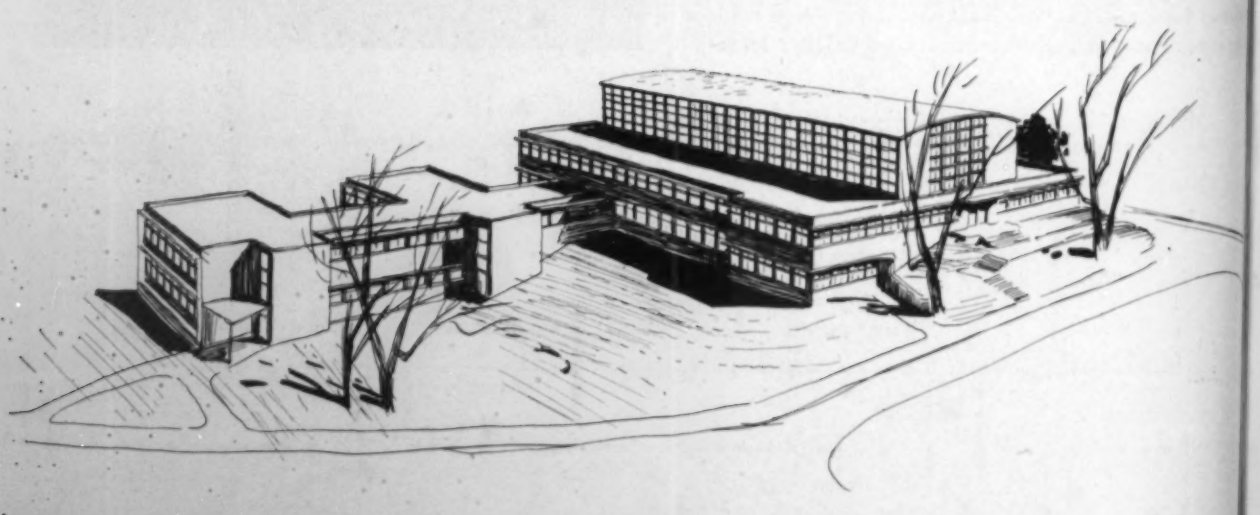
Bush-Brown & Gailey, Architects

P. M. Heffernan, Associate

With universities, as well as industries, ever seeking new facilities for research, this Georgia State Experiment Station is now expanding. The original building, shown in the photographs, was constructed in 1939, to meet a budget of strictest economy. The line drawing at the bottom of the page shows how the building will now be enlarged; the design is by the original architects, with R. L. Aeck as an additional associate.

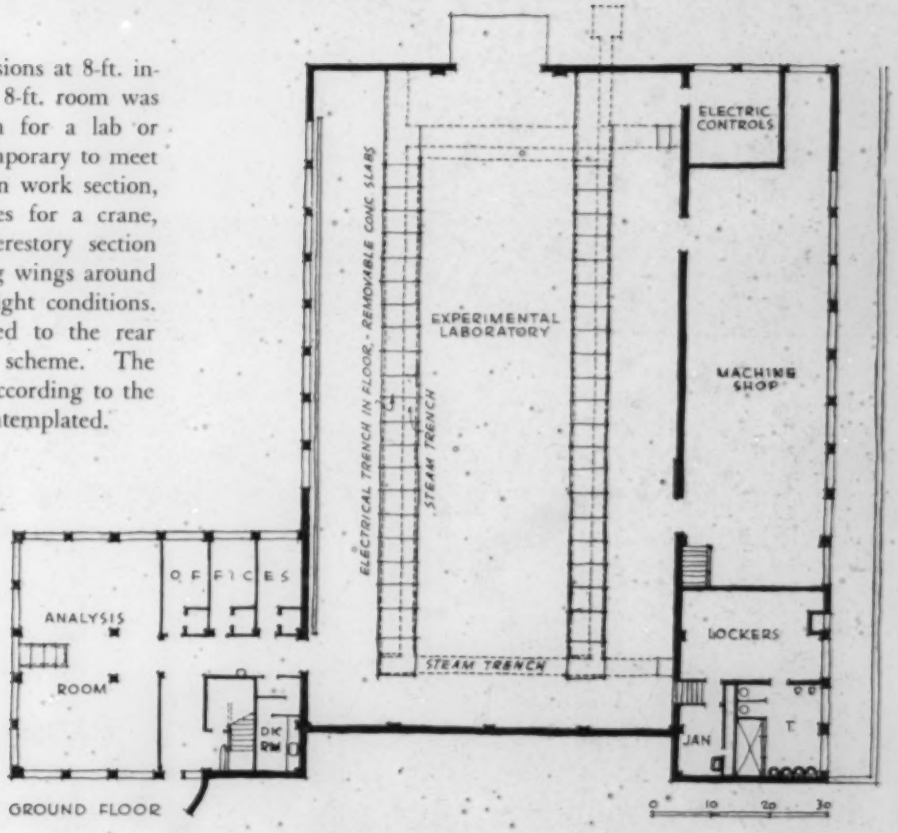
The original building consisted of one large pilot laboratory for research equipment, a machine shop, analysis room and offices. Since it was obviously only a first step it was designed for expansion, on a general scheme as follows:

A unit of construction 16 ft. between structural

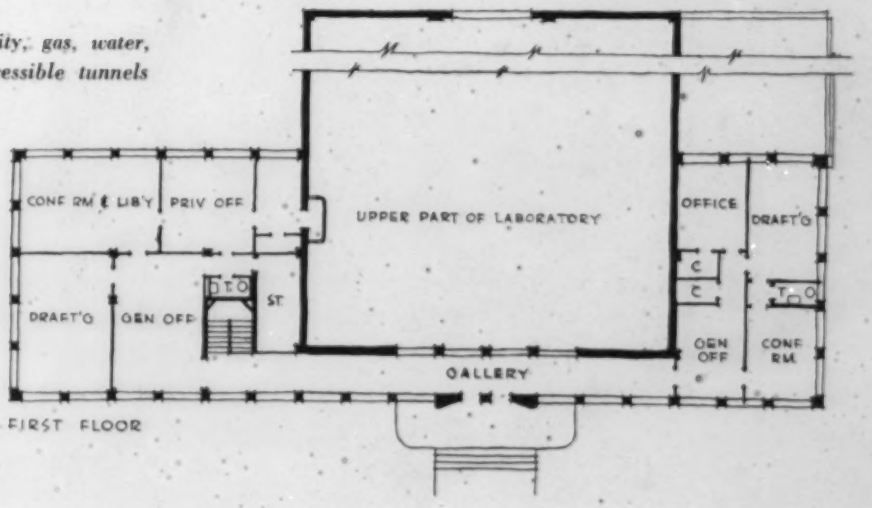


Main section is one large, all-purpose laboratory for heavy equipment. If the embryo engineers find it strictly a work room, they cannot fail to find in it something of the inspiration of modern design

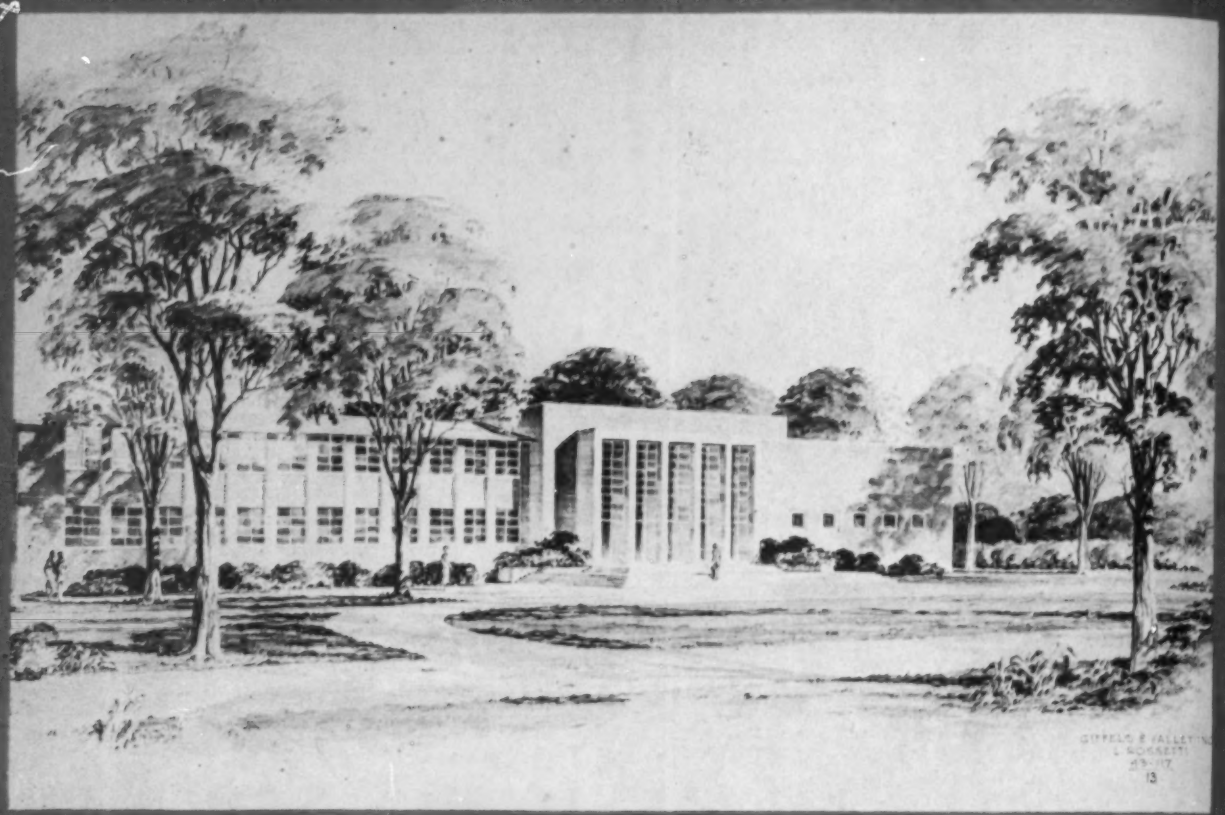
columns was adopted, with subdivisions at 8-ft. intervals, based on the idea that an 8-ft. room was the smallest reasonable subdivision for a lab or office. The partitions would be temporary to meet changing research needs. The main work section, being high and containing facilities for a crane, should derive its light from a clerestory section above the roof level, thus permitting wings around the central mass without altering light conditions. The main room could be extended to the rear without change of the structural scheme. The present addition is going forward according to the general plan that was originally contemplated.



Essential laboratory services—electricity, gas, water, air, vacuum, with drains—in two accessible tunnels



Rodney McCay Morgan photos



INDUSTRIAL GROUP ON THE CAMPUS PLAN

Nine research and manufacturing buildings on a 155-acre site, developed by the architects as a park. Wilcox-Laird, landscape architects

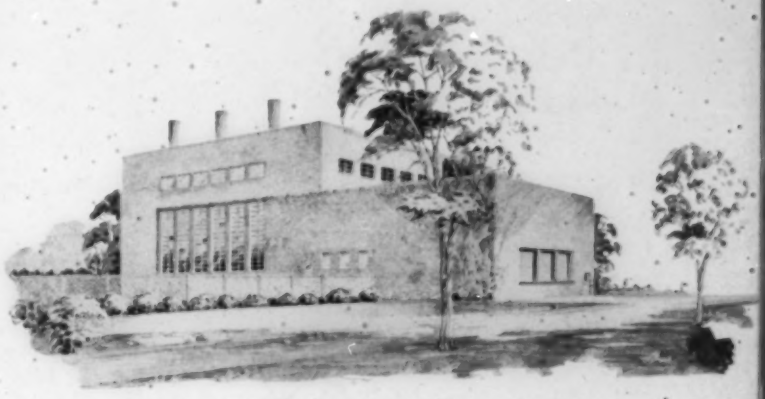
"Electronics Park" for General Electric Co., Syracuse, N. Y.

Giffels & Vallet, Inc. L. Rossetti, Associated Engineers and Architects

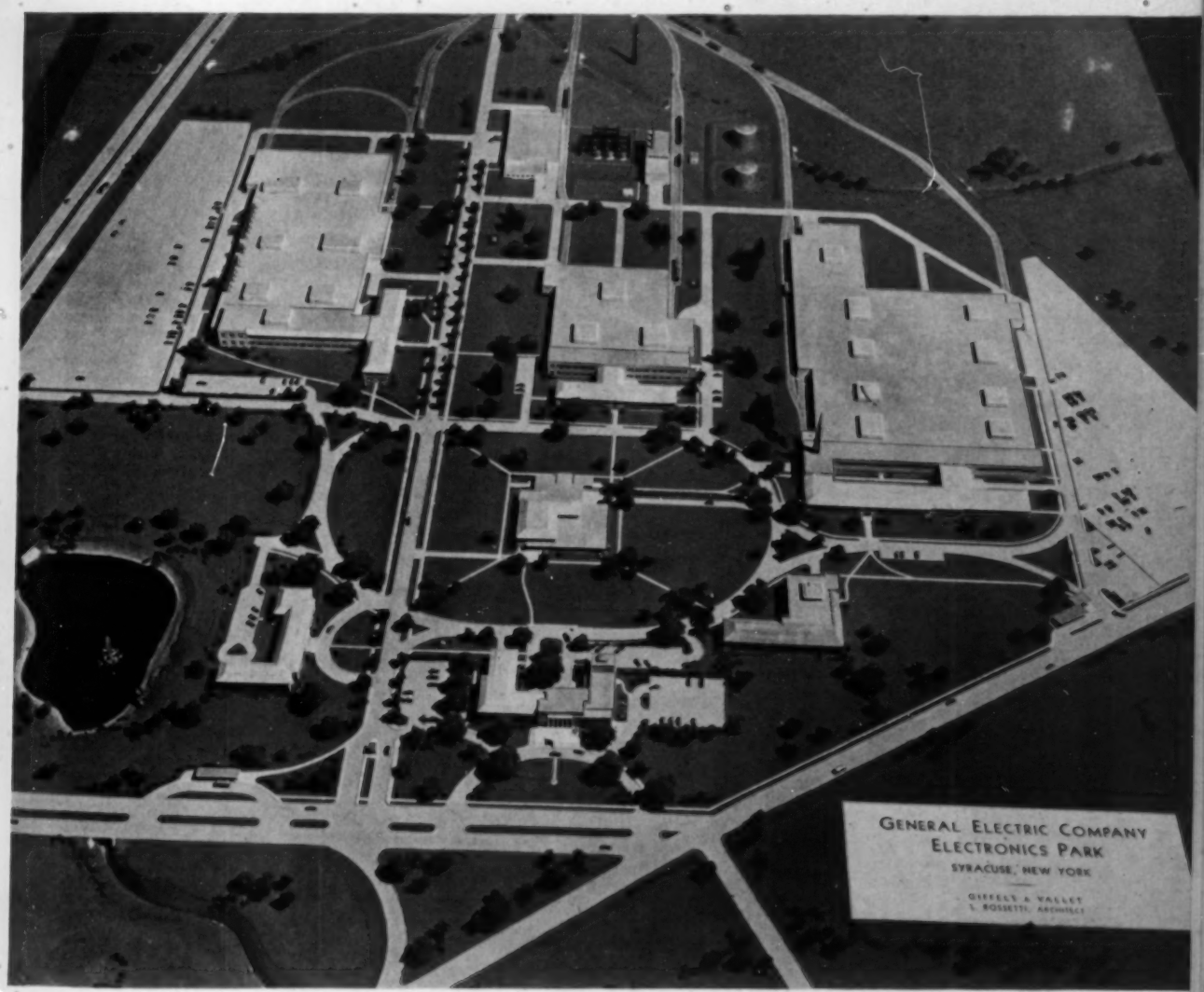
DESIGNED to fulfil its designation by General Electric as the "Electronics Capital of the World," this group of factory and research buildings develops to a high degree the campus plan which is appearing in newer industrial projects. This idea was developed with no disadvantage to manufacturing operations, and with considerable overall benefit in functional operation.

There will be nine buildings in all: Administration, Reception, Laboratory, Radio Receiver, Radio Transmitter, Specialties, Restaurant, Service and Boiler House. Each will be a self-contained unit, with its own office space. In addition to extensive research facilities there will be classrooms, auditorium, and other educational facilities.

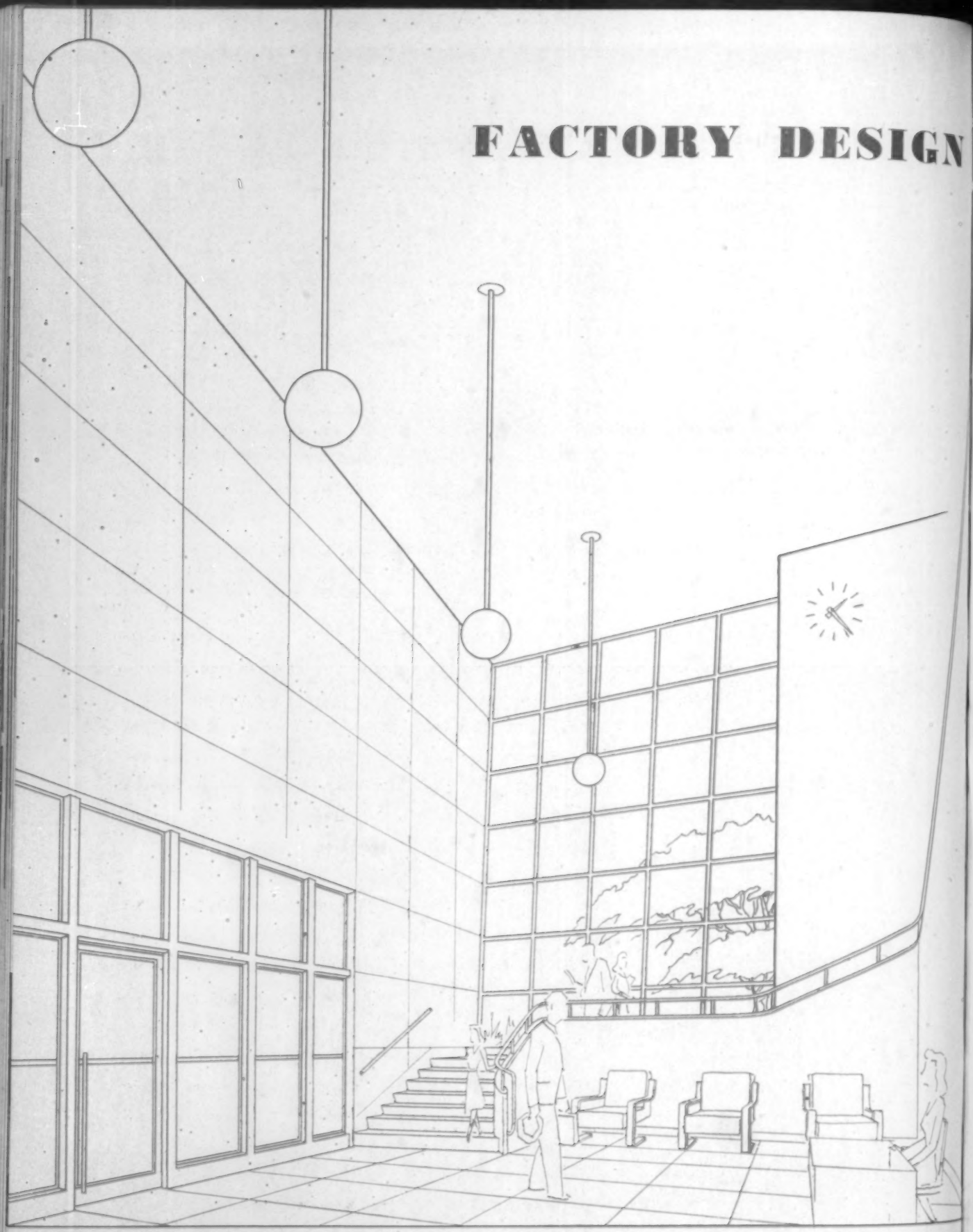
First of the buildings is already under construction; the group will be completed early in 1947, at a cost of some $10,000,000.



Convenience of its 5,000 employes will require an extensive system of paved roads and walks, parking areas, and railroad spurs, interlacing the "campus"



FACTORY DESIGN



FOR LOW-COST PRODUCTION

Industrial managers expect high costs and attach great importance to good personnel relations

To inaugurate this study, the editors of *Mill and Factory* surveyed 23 industrial plants, all of which were built or planned since 1937. Work managers, production superintendents, maintenance engineers, and personnel directors were asked about the adequacy of their present plant facilities and about the changes and improvements they might recommend.

It is on the basis of this information that the well known firm of Albert Kahn Associated Architects and Engineers, Inc., were asked to summarize the present situation in industrial plant design and to point out trends in the immediate future. Although the opinions are those of the Kahn organization, the interpretation is as representative as it could be made.

Quite naturally the main weight of the story falls into the realm of better facilities to conserve work and to further the efficiency of the employee. Progress will continue to be made in so situating employee facilities that they entail the fewest steps, are convenient and easy to use, and create as little as possible of mental or psychological hazard.

On moot questions such as the choice between the daylighted and the windowless plant, the writers have not found themselves in position to give a dogmatic answer. But they do present the line of approach which will generally be followed, which is to find out what is the actual and not the imagined behavior of the work force under the varying circumstances.

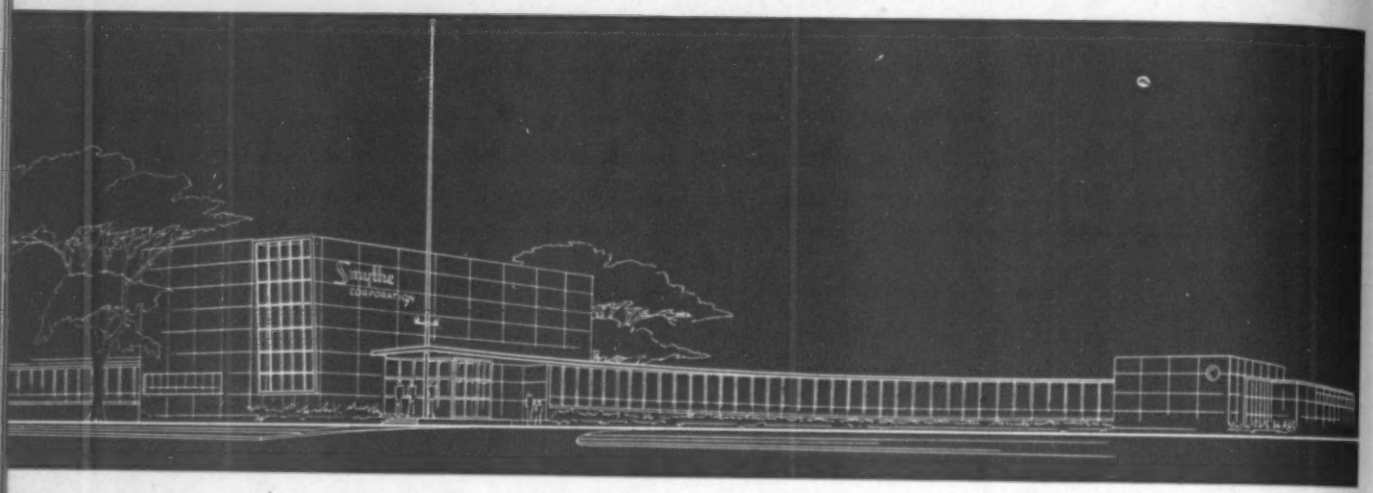
Not for reasons of swank but for better public relations and more pride of the community in its work, the authors foresee the further development of pleasant landscaping around factories, an agreeable scene, a fit environment for the day's work.

Simultaneously with its appearance in Architectural Record for its architectural interest, the Kahn study is being published in *Mill and Factory* to help bring the best thinking of the architectural profession before factory owners and managers.

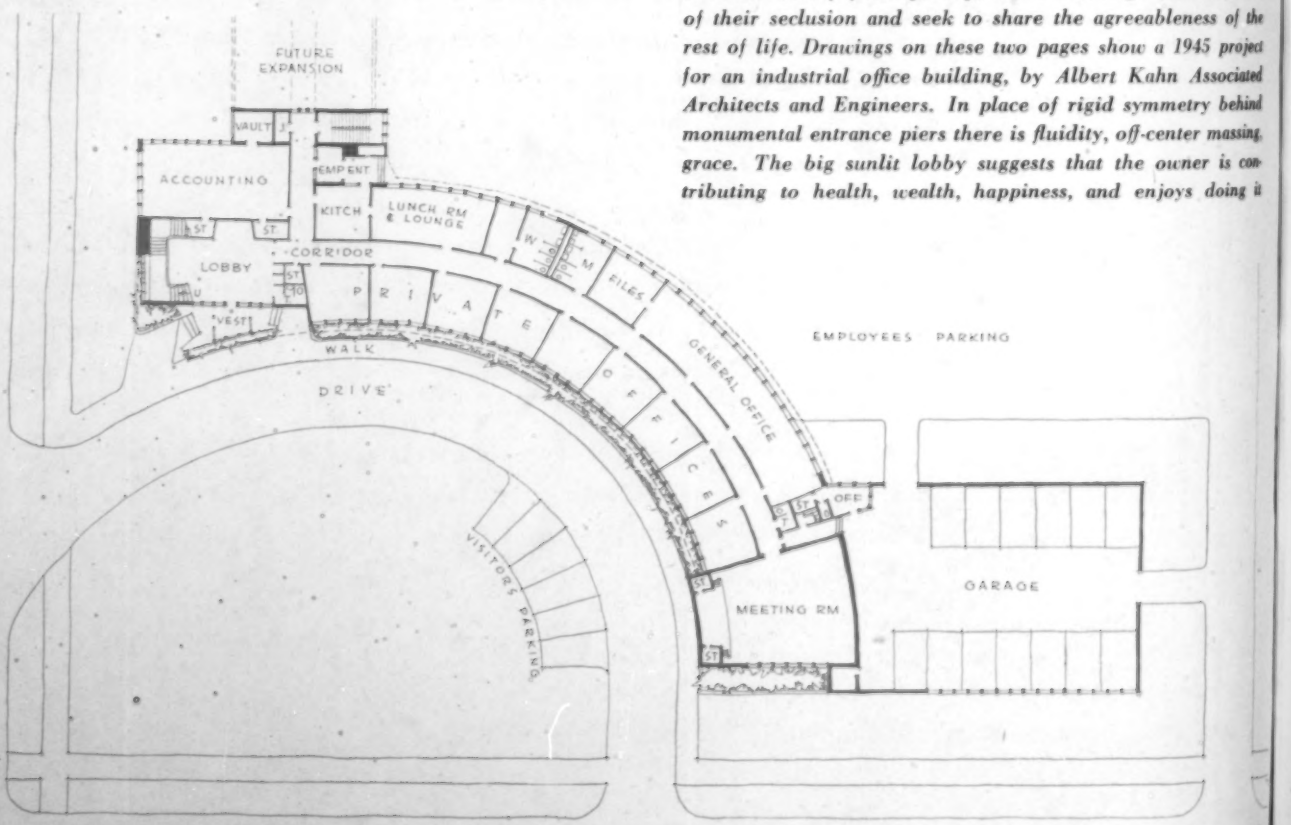
IN COLLABORATION WITH *MILL AND FACTORY*

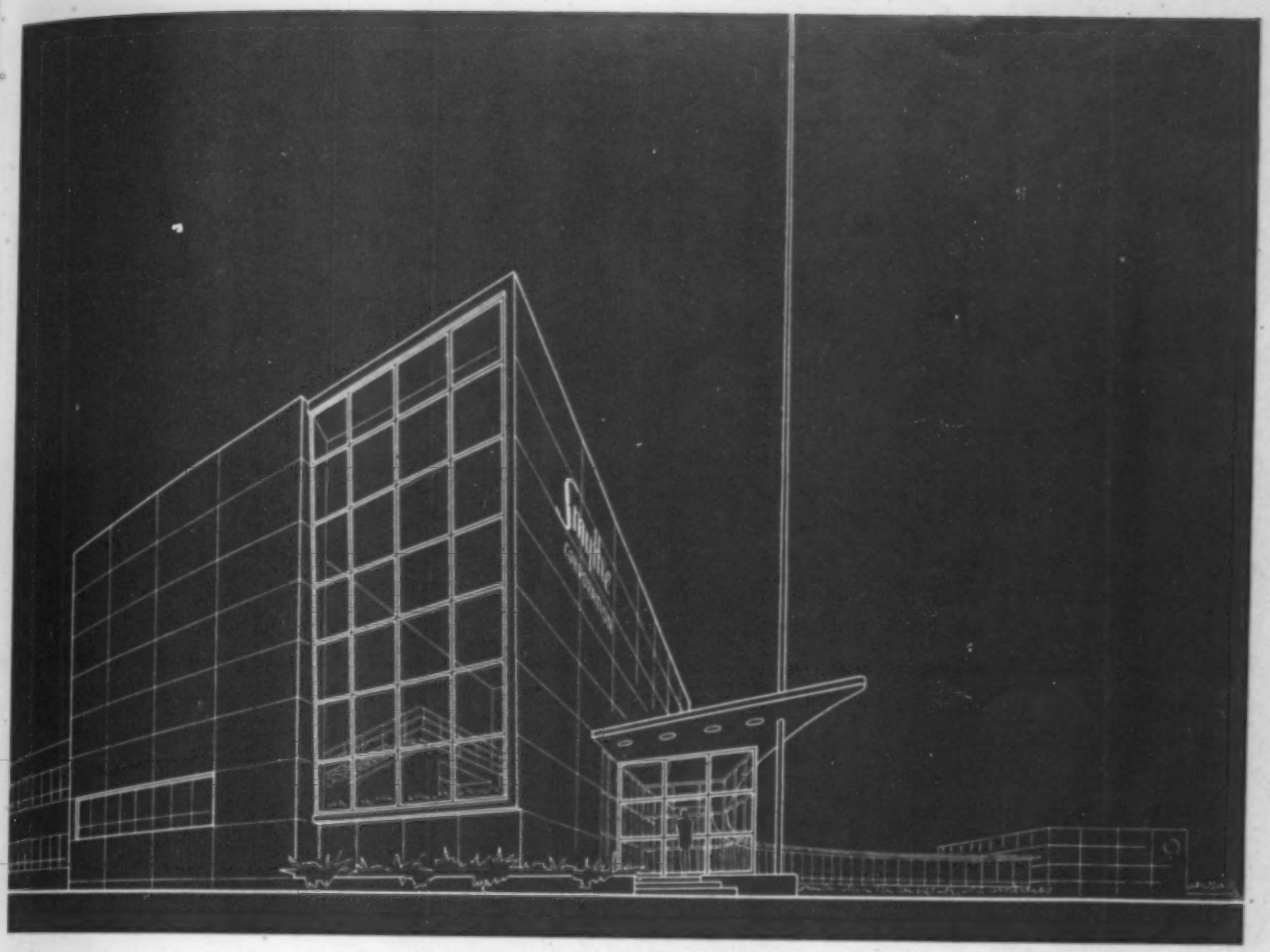
THE DESIGN OF FACTORIES TODAY

Review and forecast by members of Albert Kahn Associated Architects and Engineers, Inc.

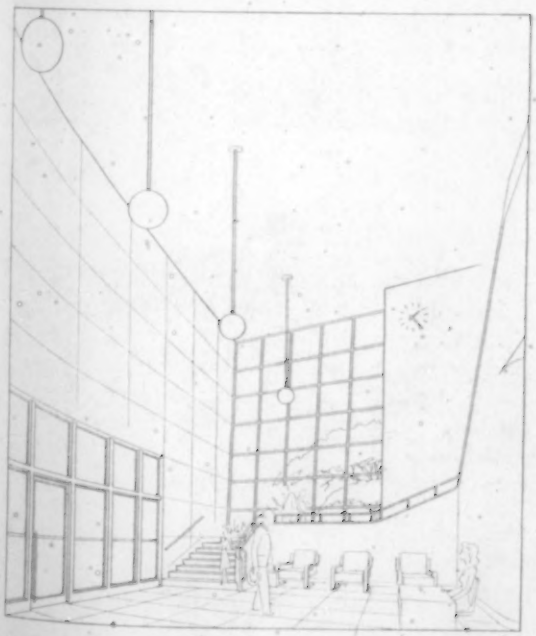


The last twenty years saw industrial buildings brought into the realm of architecture by clean decency of handling; in the next twenty years perhaps these buildings will come out of their seclusion and seek to share the agreeableness of the rest of life. Drawings on these two pages show a 1945 project for an industrial office building, by Albert Kahn Associated Architects and Engineers. In place of rigid symmetry behind monumental entrance piers there is fluidity, off-center massing, grace. The big sunlit lobby suggests that the owner is contributing to health, wealth, happiness, and enjoys doing it





GENERAL CONSIDERATIONS IN DESIGN

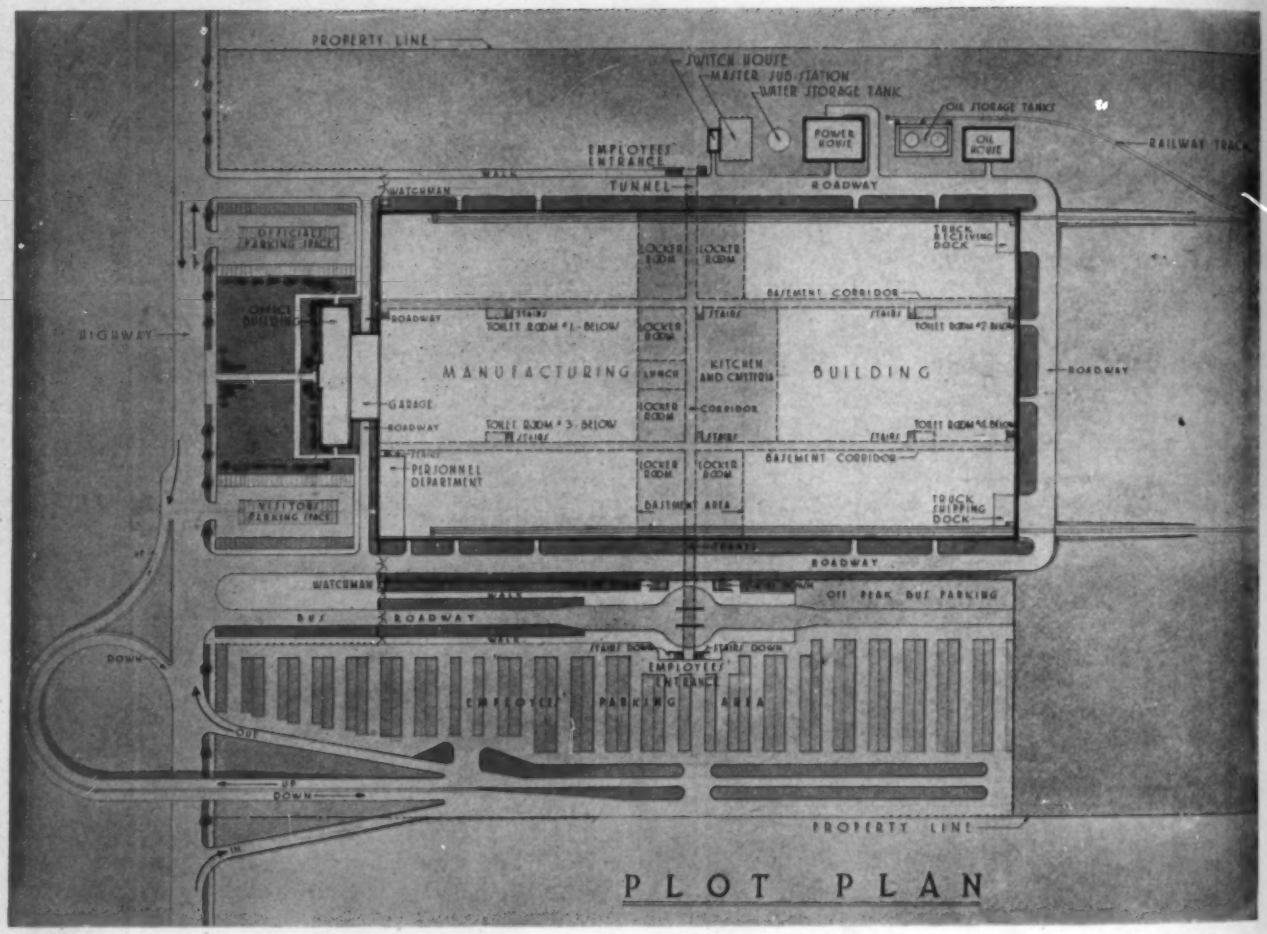


It was the firm belief of the founder of our organization and his staff of many years that industrial buildings need not be unsightly liabilities to their respective neighborhoods. The time has arrived when the evidence warrants an even more positive statement. Greater efficiency, pride and loyalty are all furthered by the creation of pleasant work surroundings. No costly embellishment or arty sentiment is required to achieve these objectives. Structural beauty can be achieved by the proper handling of mass and proportion, at no added expenditure. In some instances, the physical plant set in landscaped surroundings has been made a show place and a calculated element in the public relations program; and even where this is not the aim, community pride is maintained by a plant that is an asset.

Personnel relations have assumed such tremendous importance that major emphasis will be placed on incorporating, in every new or redesigned manufacturing area, all facilities for improving morale and preventing costly disruption of production. The day of the dark and gloomy edifice making up the typical factory of the past is gone. In its place is found the well lighted, brightly keyed, pur-

posefully arranged plant, fully equipped with all consideration of safety and convenience both for management and for personnel.

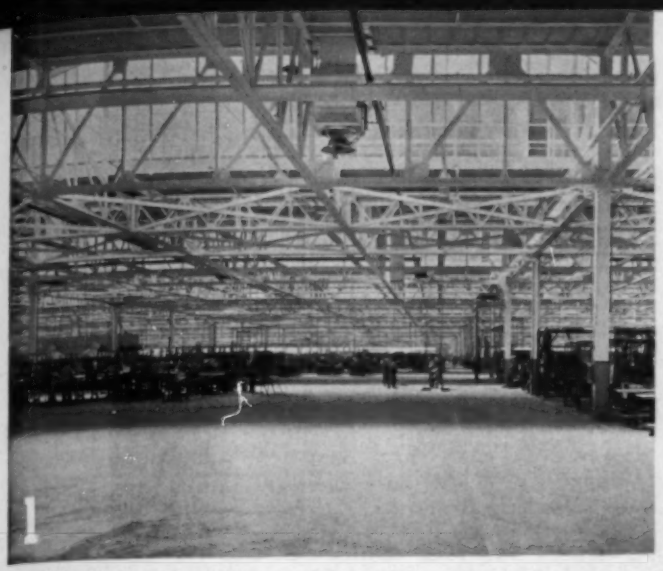
Existing plants to be reconverted to production of peacetime goods can be given a face-lifting by sand or steam cleaning and general refurbishing to emphasize the transition from war to civilian products. Where new plants are to be erected, we strongly recommend that a site be chosen which will provide ample area for landscaping, parking and for future expansion. This presupposes moving from in-city congestion to newly developed areas ade-

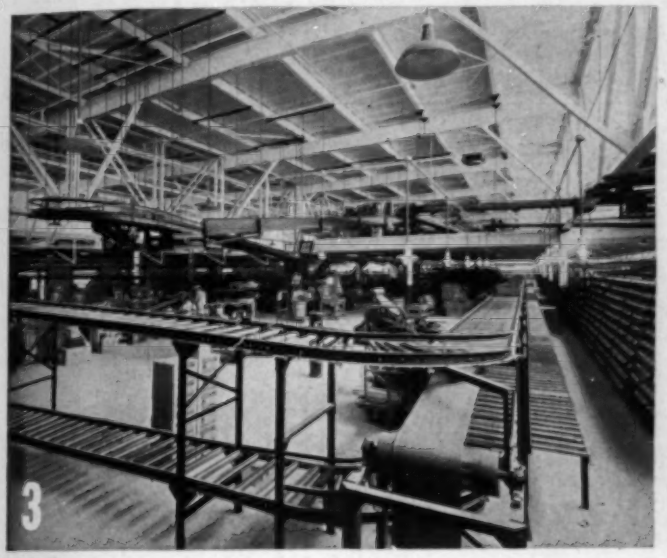


Nothing in American architecture has been more typical than this diagrammatic plot plan for a factory, based on unobstructed flow lines working with gravity. In this interpretation, employee facilities are collected in the basement, with tunnel connections, to leave the working floor clear for any possible arrangement

quately served by the necessary transportation facilities. Even though utilities such as power and sewage disposal are not available they will usually be made so by cooperation of local communities which will benefit from the addition of new enterprises in their neighborhoods.

The necessity for keeping constantly in mind plant flexibility and adaptability, whether in modernizing present facilities or in constructing new ones, cannot be too strongly emphasized. Modern markets and manufacturing processes are subject to such quick change that it is no longer feasible to put up a plant with the expectation that it will be adequate to meet the demand for one product during its full productive life.





1. ***Extra wide column spacing enforced by airplane manufacturing.*** **2.** ***Blackout plants increased during the war.*** **3.** ***Wider spans than now needed, for flexibility in reconversion.*** **4.** ***A plant adaptable to many operations***

Original plans should be drawn to provide for future expansion in an orderly manner and without interfering with present production operations. It should be possible to interchange departments without rebuilding. It should be possible to change from one production model to another model without major alterations. It should likewise be possible to switch from one product to the manufacture of an entirely different type of item while holding plant rearrangement costs at a minimum.

This foresight was evident in the design of some of those war plants which were built for permanency and with an eye to possible conversion to civilian goods after the war. It was also evident in the planning of some industrialists who put up new facilities just prior to the war. Illustrated are a few views of plants which reveal this foresight and for which we were privileged to serve in the role of industrial architects:

View 1, above, shows very wide column spacing, dictated by the type of product, in one of the largest airplane assembly plants in the war construction program. Other spacing is found in the other illustrations, for instance,

View 3, the warehouse of a large paint manufacturer, completed before Pearl Harbor. Note that the spans, although naturally far less than in the airplane plant, are wider than would have been necessary for this particular operation. The building could, if desired, be quickly and easily adapted to many other uses.

View 4 shows a corner of the packaging department of a cosmetics manufacturer. Note the high ceiling, spiral column conveyors for empty containers, concealed wiring and piping, natural daylight, and a general air of cleanliness. A plant designed along these lines could house many different types of operation.

View 2 shows the corner of one machine shop in a complete blackout project. There is temperature and humidity control throughout. As a result of wartime experience with this type of building, some industrialists are more receptive now than formerly to the idea of a blackout plant for civilian production. This subject will be examined more thoroughly in the section on lighting.

FACTORY DESIGN—

ACCESS AND PARKING

For the users of private cars, parking areas should be sufficiently large to allow for one-way movement of traffic through the lot to avoid congestion. This implies separate entrances and exits opening on arterial driveways of adequate size to carry the traffic burden during the peak hour, which will occur during the change of the two largest shifts.

The area must be large enough to accommodate the total number of cars for the two largest shifts. There will be variations among individual plants, depending on conditions of employment, but it is a good average rule that for every three or four square feet of production floor space for a normal manufacturing operation there will be required approximately one square foot of employee parking area. Just as provision should be made for future plant expansion, so should the probable need for larger parking areas be kept in mind in selecting a new plant site for an industry capable of expansion.

The parking area should be adequately drained and surfaced to control dust and mud. Naturally, it should be located as conveniently as possible to the plant entrances; and if a safety hazard intervenes between the lot and the plant, such as a heavy traffic artery, over- or under-passes should be provided.

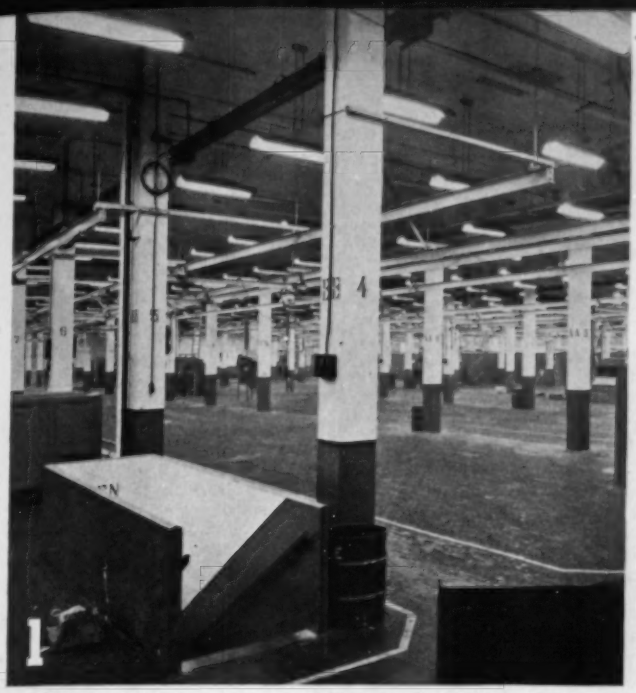
We recommend an 8-ft. space per car in the lot, and from 60 to 65 ft. between rows of cars. The larger view above shows an orderly arrangement involving a minimum of loss for employees in getting to and from their homes.

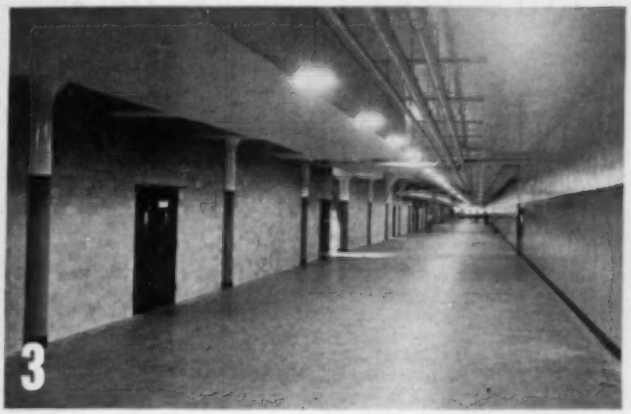
Because of the size of some war plants, separate parking lots were provided at different locations on the plant property so that employees could leave their cars and reach their work stations with a minimum of delay. However, much of our thinking was pitched high during wartime and now needs to be scaled down to a reasonable peacetime expectancy. It is our opinion that the backbone of our economy will be the larger number of plants employing 3,000 workers or fewer, and strategically located in industrial areas.

Although our photographs were made from war plant installations, they represent a certain phase of industrial architecture which we believe to be desirable whether the postwar plant employs hundreds or thousands of workers.

From the transportation station or parking lot, we prefer to bring the employee into the plant through a basement and tunnel system under the work floor.

NEXT after the physical appearance of the plant comes the factor of convenience in transportation. Even before the introduction of wartime restrictions it was demonstrated that a large share of traffic would be by public transportation facilities where these are adequate. For the patrons of this transportation there should be sheltered waiting stations conveniently located in relation to employee entrances to the plant, and passageways for quick, safe ingress and egress. It is important to provide adequate space for buses to turn and park in while awaiting the end of a shift. The lower photograph on this page shows one kind of arrangement, used in a complete blackout project where workers step directly into the plant from the buses.





1. *Stair to employee toilets in basement occupies minimum space.* **2.** *Alternate arrangement: facilities in mezzanine, materials or tools below.* **3.** *Access tunnels must be wide enough for trucking.* **4.** *Lockers and wash fountains*

FACTORY DESIGN— EMPLOYEE FACILITIES AND CIRCULATION

Efficient production demands that employee facilities shall not simply be placed in "space left over" but planned for the best use of time

We believe the production floor should be kept as clear as possible of all non-production obstructions for the sake of cleanliness and adaptability and flexibility. Toilets on the production floor may stand in the way of a needed new conveyor, and lockers may block the path of a projected new production line. The necessary corners and angles formed by lockers and similar facilities are also dirt catchers and elimination of them reduces the housekeeping burden on the production floor.

Sometimes because of rock, ground water, or other soil conditions it is not practical to provide a basement. In such cases we recommend locating employee facilities on a mezzanine and bringing the men down to the production floor instead of up from the basement. A mezzanine layout follows the same essential pattern as the basement design shown in the accompanying illustration.

The reason we prefer a basement to a mezzanine is that to get necessary clearances it is generally advisable to go so high with the mezzanine that considerably more steps are required to reach toilets and lockers located there than in the basement. Not only are the extra steps fatiguing to the workers, but it should also be kept in mind that if

Pedestrian walkway off the production floor. "It was found desirable to add a shield along the inner side to prevent swirling skirts above from offering too much distraction"

conveniently located facilities can reduce by only one minute a day the time spent by a worker in going to and from toilets, the sum total of savings in a plant of 6,000 men adds up to 100 hours a day which would otherwise be non-production expense.

The ideal basement layout will have one or more main tunnels similar to that shown in view 3, previous page. Tunnels this size provide not only for heavy pedestrian traffic but can also serve as a driveway for low clearance platform trucks to deliver food to the kitchens and remove garbage.

While few plants will require a tunnel of this width, the main underground corridor in any plant should similarly be flanked by doors and entrances to cross-corridors, locker and wash rooms, cafeterias, toilets reached by stairway from the production floor and stairways to various departments above so that employees can reach their work stations without cross-traffic and the resulting confusion on the production floor.

Whether time clocks should be located at the outer ends of the main tunnel, in the locker rooms, or upstairs on the production floor is a controversial subject which will be determined by management at each individual plant. It is our opinion that management in general prefers to have the time clocks located in each production department and punched just before the worker goes on his machine.

Entering the tunnel, the employee goes first to the locker room, the first doorway to the left shown in view 3, previous page. An ideal locker room arrangement is shown in view 4, previous page, with the row of lockers on the right duplicated on the left. The distance between the double row of lockers, where the Bradley wash fountains are located, is 16 ft. A minimum distance of 9 ft. should be provided from center to center of the fountains. Each fountain accommodates 10 men at one time, and one fountain is adequate on the average for each 100 employees.

Only limited toilet facilities are provided in the locker area, employees using mainly those toilets which are located near their work stations. Similarly, only limited wash facilities are provided in the local work station toilets, usually not more than one or two wash basins, since workers prefer to do their main washing in the locker room just before leaving for home.

Various types of lockers are available, and in some modern plants workers even hang their clothes on poles attached to racks on the main production floor, the racks then being hoisted to the ceiling until the end of the shift. It is desirable to provide one locker, or at least one locking compartment, for every employee on the payroll. Necessary locker room space averages 3-4 sq. ft. per employee.

The question of showers is still in the debatable stage. Experience so far shows generally that the demand for them is greater than the use. Unless a production operation is particularly dirty, such as some types of foundry work, workers will not stop at the end of a shift to take a shower and then get back into their work clothes. They want to get home, get a shower there, and get into clean clothes.

It has been extremely important in wartime, and may be so to a lesser extent in peacetime, to provide flexibility in toilet facilities for men and women workers. Partitions should be so designed that they may be easily switched to provide accommodations for the different sexes in direct ratio as the proportion of workers changes.

The number of individual toilets to provide is generally regulated by building codes. Where no other regulations prevail, it is prevalent custom to use the New York State code which seems reasonable and fair. It requires one toilet for every 20 women and one for every 25 men in plants of limited size, with certain increases in these ratios as the number of employees gets up into the hundreds and beyond.

As a general rule, toilet rooms should be so frequently spaced about the plant that no worker need walk more than 200 ft. to reach one—again to effect the time saving mentioned earlier. Time lost to production in going to distant toilet rooms costs much more than the expense of an additional installation.

Methods of locating toilets vary widely. As stated, we recommend locating them in the basement area where they may be reached by stair entrances such as is shown in view 1, previous page. This method provides a minimum of obstruction on the production floor.

Where employee facilities are located on the mezzanine, toilets spacing is similar to the basement spacing. This practice is shown in view 2, previous page. A further variation of this method is to locate a tool crib on the production floor in the area below the toilet. Both methods have the obvious disadvantage of requiring a fixed stairway and overhead obstruction which may interfere with a desired change in the plant layout at some future date.

Supervision over the use and abuse of toilet rooms as lurking places for loafing or play is worth considering in the light of experiences which factory management may have had. We are inclined to think that toilet rooms located below the floor levels are more easily supervised.

A large basement cafeteria. "Unless the total meal period is at least 30 minutes long, cafeterias and dining rooms should not be considered. But their absence increases house cleaning"

FACTORY DESIGN—

PERSONNEL FEEDING

"The average employee may soon be better fed in the plant than at home." The planning of food facilities depends closely on the scheduling of employee time for meals

THE relationship of proper feeding to production efficiency has been conclusively established by various detailed studies of the subject, and as a result the time seems not far distant when the average worker may be better fed in the plant than at home. This is already true in some war plant communities with emergency housing or trailer camps as the only available dwellings. In some such localities, with inadequate home cooking facilities and the further complications of the point rationing system, workers are eating not only lunch, but breakfast, and dinner as well, in facilities provided within the plant.

Instead of being treated as a minor matter, therefore, industrial feeding warrants close study of existing facilities or projected new facilities to determine their adequacy for an efficient postwar organization.

It was general practice formerly to designate some non-production area in the plant as a cafeteria or dining room and have equipment manufacturers submit plans and bids. Since each manufacturer was interested only in the sale of his own product, this practice had the obvious fault of failing to bring the over-all feeding scheme of the plant into one unified pattern.

Carefully vented battery of ranges in the view below is to be seen again in the background of the view above. The size of the plant kitchen depends on the size of the total work force and not, like the dining rooms, on the largest shift

The first and most important test to apply against any projected plan is this:

Are the facilities close enough to employee work stations, and are they of sufficient size and number so that employees can walk from their work stations to the dining room, stand in line at the cafeteria counters, eat their food at a dining room table, and return to their work stations within the time allowed them for their complete meal period?

To get this information, especially on large projects, a dimensional plot should be drawn of the entire factory showing the approximate number of employees in the largest shift in each area. It is also necessary to know the length of time allowed for meals and for the complete meal period. (The latter should, generally, not exceed 90 minutes.)

The number employed on the *largest* shift, the location of their work, the length of their mealtime allowance and the over-all mealtime, determine the size and location of dining rooms and the required equipment.

The total number of employees in *all* shifts determines the size of the kitchen, the store rooms, refrigerators, toilets and locker rooms, and other similar employee facilities.

Unless the meal period is at least 30 minutes long, cafeterias and dining rooms should not be considered. Where they are not used the burden of house cleaning on the production floor and around the plant is increased. For the sake of better housekeeping, some industrialists would like to dispense with the food carts sent through some plants at given intervals. Studies have indicated that in many instances these portable carriers provide the only breakfast that is eaten, and to dispense with them would seriously hamper production efficiency.

Experience has shown that where a plant employs overlapping shifts, an average of 75 per cent of total employees will patronize the plant eating facilities. By providing facilities for the total number on the largest shift, a margin is provided therefore to clean tables between shifts and to provide for those who linger and smoke after their meal.

Separate facilities should be provided for the hourly rate men and the office workers not for any reasons of class or caste, but because of the hazard of dirty work clothes.

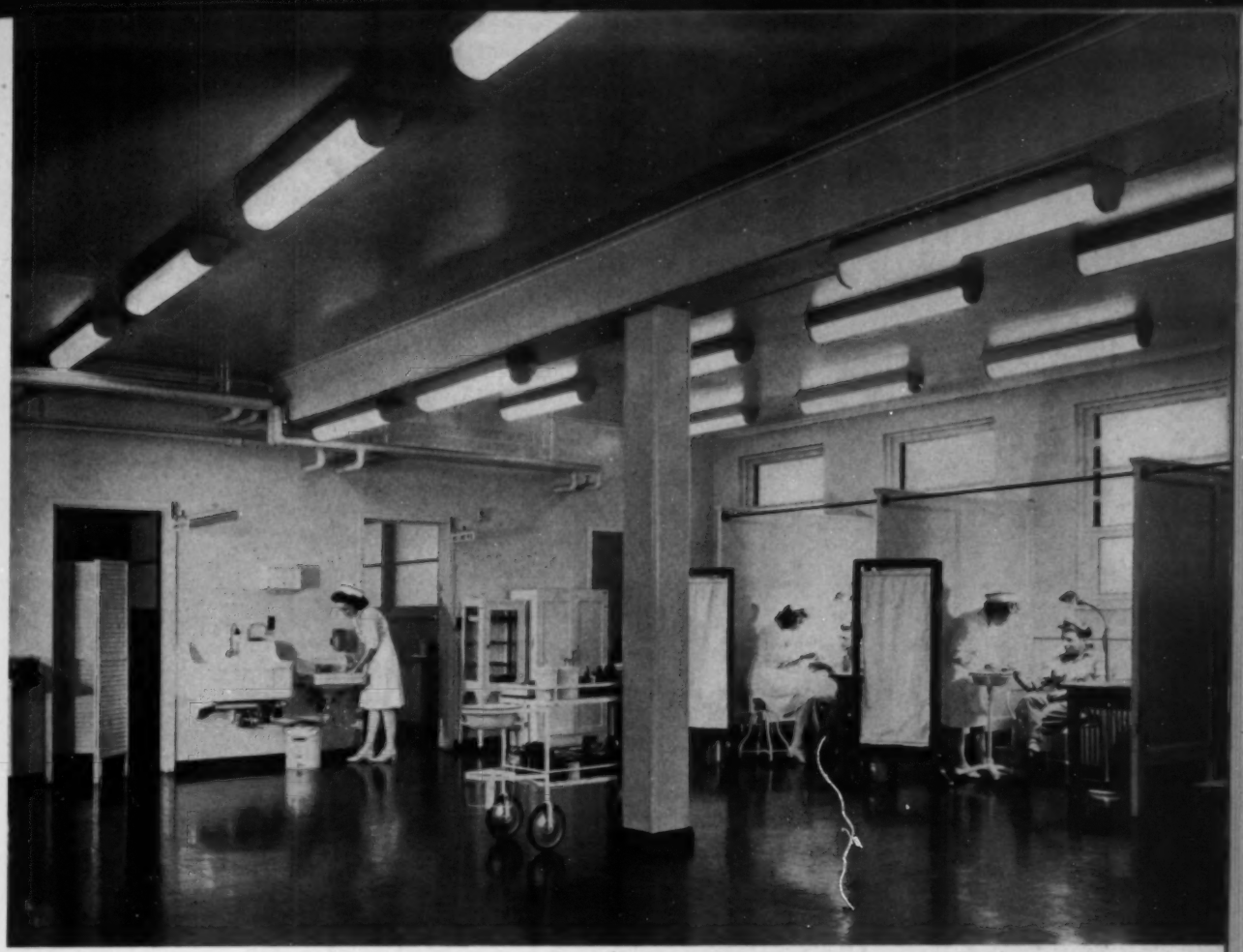
One of the commonest faults in industrial cafeteria installations is failure to provide adequate space for unboxing of food, bottle crate storage, garbage refrigeration, and other space-consuming "incidentals." This is sometimes so serious as to interfere with the orderly preparation of food, and any holdup on the cafeteria line may result in production time waste far greater than the expense of properly planned and adequate storage areas.

The dining room plan should include not only a layout of cafeteria counters, but of necessary silver sections, water fountains, glass racks, service stands, cash registers, change machines, ventilation equipment, and the like.

The total cafeteria area per employee will average from 10 to 12 sq. ft. exclusive of the kitchen. It is generally possible to accommodate more people at square or round tables seating four than at long tables or benches.

The accompanying views show typical industrial installations with varying service facilities in arrangements which are orderly and modern.

While the manufacturer provides eating facilities as an integral part of his plant, there is a growing disposition on his part to lease out the operation of it to a food concessionaire. It is frequently run by the manufacturer at a loss, and particularly in these war times the average industrialist has been beset by so many problems that he is anxious to avoid taking on the additional headache of feeding. What the ultimate trend here will be is not yet clearly indicated.



FACTORY DESIGN—

FIRST AID AND HEALTH

In some recent instances the industrial plant has installed a complete hospital in miniature, but usually needs less

CLOSELY allied with other provisions for personnel are the plant first-aid and hospital facilities. No hard and fast rules can be laid down here because of the many variable factors and because of the differing ideas of industrialists on the subject. Among recent installations the size varies. from accommodations having nearly the completeness of a small general hospital, with full-size hospital beds, down to facilities containing practically all available equipment in an individual room.

Local first-aid provisions throughout the plant will likewise range from suspended wall cabinets to small rooms with space for the injured worker and an attendant. Where a plant is located far in the country, out of the vicinity of a local general hospital, an operating room may be desirable, but as a general rule it would seem preferable to utilize community facilities.

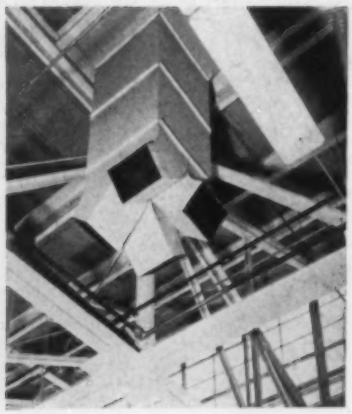
One or two cots where injured workers may rest before going home are desirable and should be generally ample. The hospital, of course, should be so located that a worker returning for treatment need not pass through the production area. The hospital should likewise be located adjacent to the personnel department so that new employees may be given a physical examination upon being hired. This may require X-ray and dental equipment, according to the completeness of the examination given. This is based on factors in labor relations, such as time loss and compensation reduction, and reduced labor turnover.

The view shows a fairly complete first-aid installation.

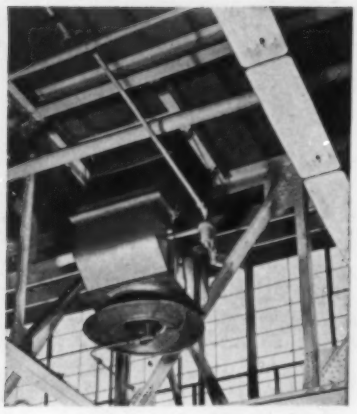
FACTORY DESIGN—

HEATING

AND VENTILATING



The wisdom of using complete air conditioning, or the new radiant heating, depends on individual cases

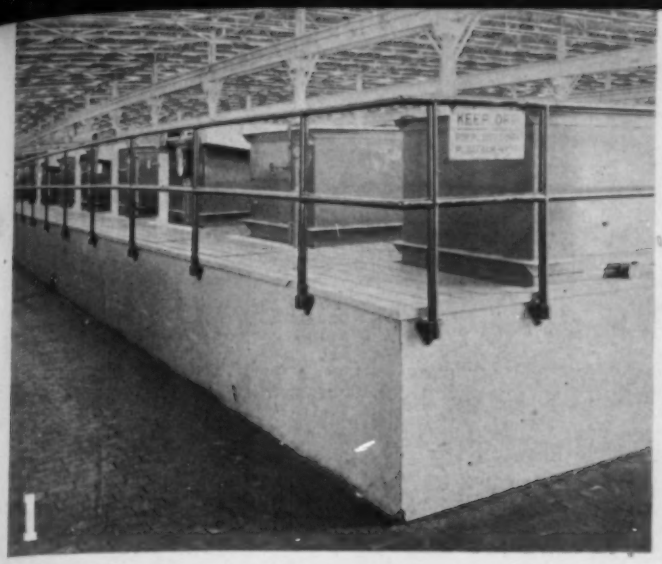


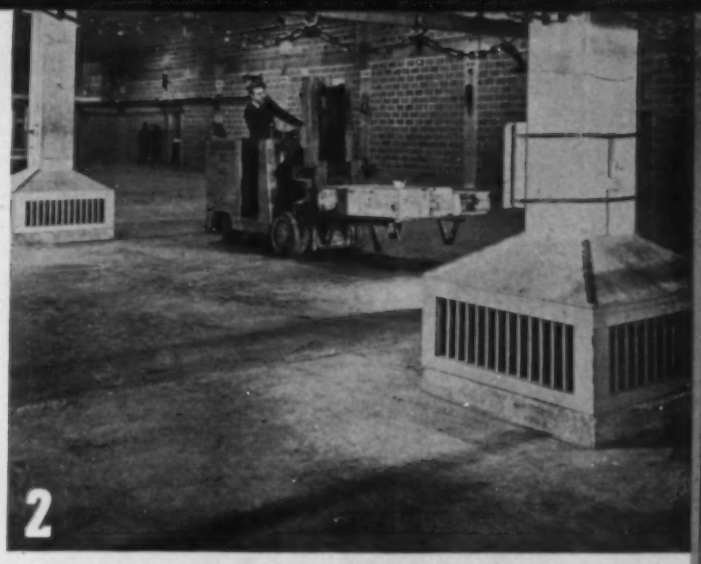
VENTILATION, like various other aspects of industrial design treated in this section, is subject to almost infinite variations according to the type of project and the related installations. Where air conditioning is widely used either for general offices or control of precision manufacturing operations, problems of ventilation are correspondingly reduced since the conditioning equipment itself provides free circulation of filtered air and controls are necessary only to replace the air dissipated from the conditioning system.

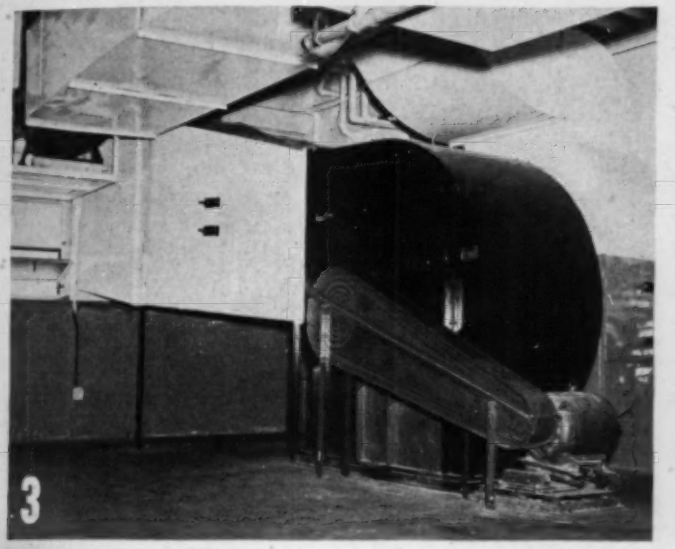
Windowless blackout projects erected for war production threw emphasis on a basic principle of ventilation which some plant engineers were inclined to overlook prior to the war: that when air is exhausted from a manufacturing area, provision must also be made to replace it. Some engineers went on the premise that opened doors and windows would provide adequate air replacement. Experience has shown, however, that frequently the rate of exhaust was greater than the volume of intake, thus creating a partial vacuum in the working area.

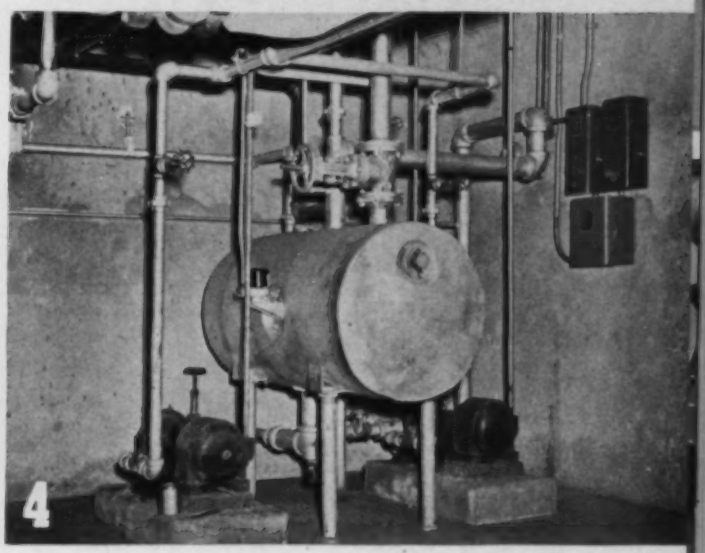
The views at the right show installations to provide

Standard ventilating practice is illustrated in the three views on this page and the page opposite. Top, a supply vent for summer only, supplying approximately 10,000 c.f.m. Center, winter unit with a heating coil, drawing air through a 4-ft. opening in the ceiling. Right, battery of winter unit heaters throwing down a curtain of warm air behind hangar doors









1. *Venting jackets carry off exhaust from plating tanks.* **2.** *Exhaust vents in columns of foundry prevent spread of dust.* **3.** *Typical fan room.* **4.** *Pumping station for condensate in tunnel of a factory heating system using steam*

a balanced air supply both summer and winter, and while these illustrations are from a wartime blackout project, the same principle applies regardless of the type of structure.

The top view, opposite page, shows one in a series of ventilating units hung from the roof above a manufacturing area. The unit shown in this picture is used for supplying air in the summer only, since there are no heating coils installed in this unit; these ventilators usually have a capacity of 10,000 c.f.m. distributed over about 5,000 sq. ft. of floor area. Using these units in conjunction with typical exhaust units in the sizes and areas mentioned above it is possible to hold the air temperature of the average factory to about 10° above the outside temperature in hot weather.

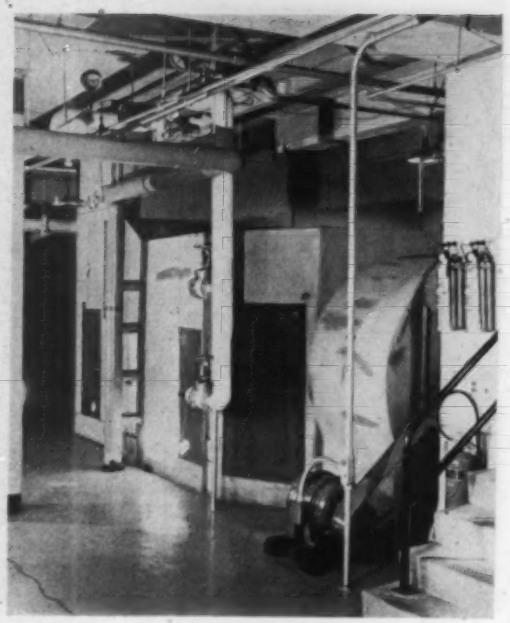
A heating coil in the unit shown in the middle view, page 130, warms air which is drawn in from the outside in winter time through a four-foot roof opening and disperses the heated air over the production area. These heaters are available now as packaged units.

These winter supply units, as we call them, are either of two sizes, depending on the area to be covered. For the average use of ventilation only, they are used in a 19,000 c.f.m. size, with enough coil to heat the air about 10° above room temperature which is approximately 80°. Usually enough of these units are installed to provide air change throughout the plant, though more can be installed if the process exhaust from the building requires more supply.

View 3, this page, and the picture on the next page show typical basement fan rooms.

Noxious fumes generated by certain process work require special ventilation installations. An effective method of dealing with this problem in a plating department is illustrated in View 1, above. Note the metal hoods near the top of the cabinets. Fumes are drawn off, before they can be dissipated in the room, through one-inch slots leading into exhaust ducts, and are discharged through stacks high above the roof.

Foundry ventilation is best achieved by forcing clean air in at the floor level through column ventilators such as those pictured in View 2, above. This lifts the



Another view of a typical factory fan room

smoke and dust in the foundry to the exhaust ventilators in the roof without dispersing or circulating it through the general area.

Air conditioning, closely related to ventilation and heating, has three basic requirements for a normal installation: steam, electric power, and water. The relative availability of these three items will determine the type of system to be selected. Because steam can be generated from any type of fuel, it creates no problem except that the products of combustion should not be a hazard. Electric power, if not available from a central power station or a public utility, can be supplied by Diesel driven generators.

Water, though generally plentiful, may be most critically short in some areas. Refrigerating equipment used for dehumidifying the air requires a relatively large quantity of water. If the supply is limited, cooling towers may be used, thus providing for the repeated use of the same water, with approximately one per cent additional supply required for makeup.

Wherever there are dust or dirt particles floating in the air, the conditioning equipment will necessarily include an efficient air filter to supply pure air to the distribution system. The arrangement of tempering coils, air washers, cooling and reheating coils may vary considerably in different areas, depending primarily on the limits and variations in outdoor requirements. In areas where zero temperatures prevail for a considerable length of time and the vapor pressure of the outdoor air supplied to the building must be increased, the typical sequence would be: Air filters, tempering coils, air washer including the cooling coils, the fan unit, and finally the heating coils. The heating coils are placed on the discharge side of the fan unit to allow for the control of the temperature in areas where the heat gain varies at different time intervals. This arrangement allows for humidity control either by regulating the temperature of air leaving the tempering coils or by heating the water in the air washer to the proper differential above the desired dew point.

Cooling effect is normally obtained by mechanical refrigeration of the direct expansion type or by means of chilled water, the water being cooled by centrifugal machines. The latter method is commonly used for loads in excess of 200 tons and where air conditioning units are scattered in different parts of the building.

Where windows need to be kept clear of fogging due to water vapor on the glass, e.g., in installations in control towers of airports, the problem has been satisfactorily solved by providing a high rate of warm air movement against the window surfaces. This is accomplished by jets in the window sills which discharge the warm air vertically and sweep it past the window glass. The jets are usually about one inch wide and extend for the width of the window. If the total air supplied through the jets is insufficient to compensate for the heat gain or loss, supplementary quantities may be supplied at some interior point.

Closely allied with conditioning and ventilation is the subject of heating, now in a most interesting phase of development because of the emergence of radiant heat and the return of the hot-water heating method to general office areas.

Before examining these trends, however, let us deal with the fundamentals of a typical layout. The first consideration is the location of the boiler house, although small plants or those not utilizing steam for process work may not require a boiler house. In this case heating is best accomplished by the direct firing method utilizing either gas or oil.

For the typical large project, however, a boiler house will be necessary and three major factors will determine its location:

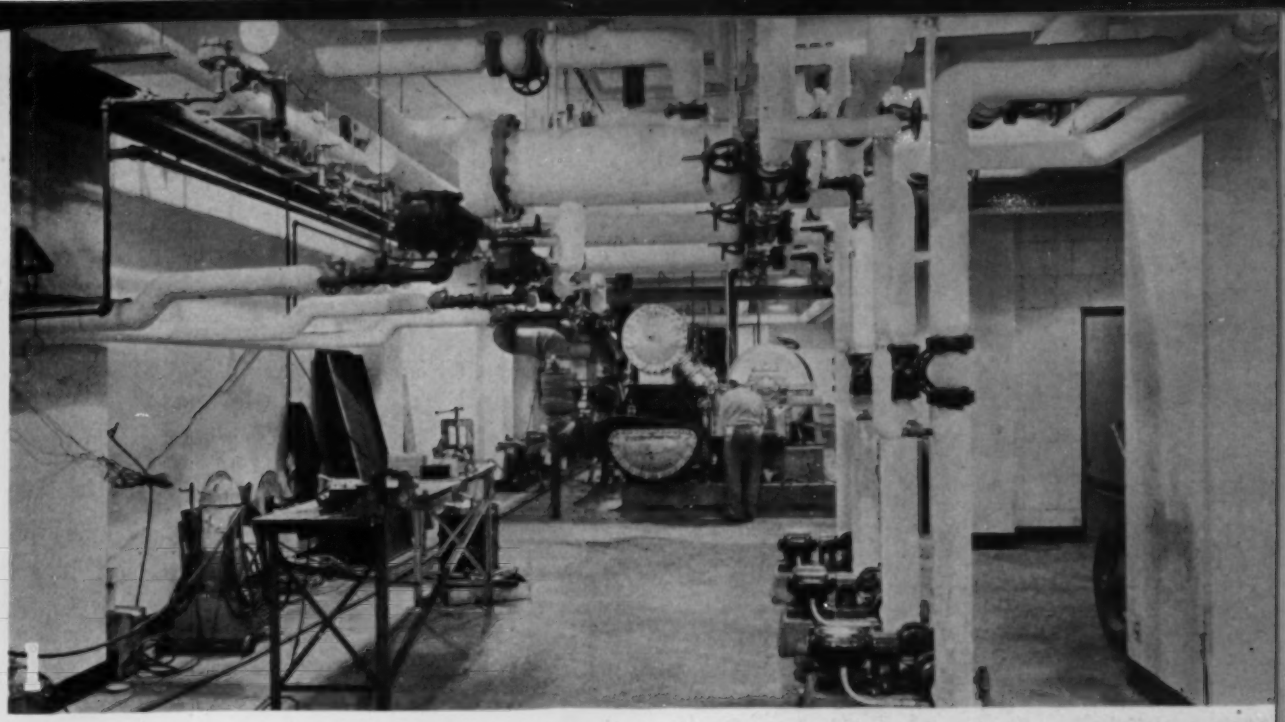
1. It should be positioned centrally in relation to the various buildings so that steam can go in all directions. This is a most important cost factor when it is remembered that the average expense of piping on overhead trestles runs about $25 a foot and the more desirable method of tunneling the piping costs about $50 a foot.

2. It should be located convenient to a railway spur line for economical handling of fuel.

3. It should be positioned on the manufacturing site so that in the event of future expansion it can also service the new area without extensive alteration or building.

Boiler capacity is of course determined by the projected requirements for heating and process steam.

The tunnel connection between the power house and



1. *Air conditioning installation, showing turbine-driven compressor for refrigerant (at rear), water heaters (top left) and water pumps (on floor, right foreground).* **2.** *Tunnel for steam and water pipes.* **3.** *Another view of the air conditioning installation above, showing pipes carrying chilled water. These views are from progress photographs taken during building*

the main manufacturing area of a large wartime project is shown in View 2, across-page.

Typical basement pumping stations at the plant end of the tunnel are shown in View 4, page 131.

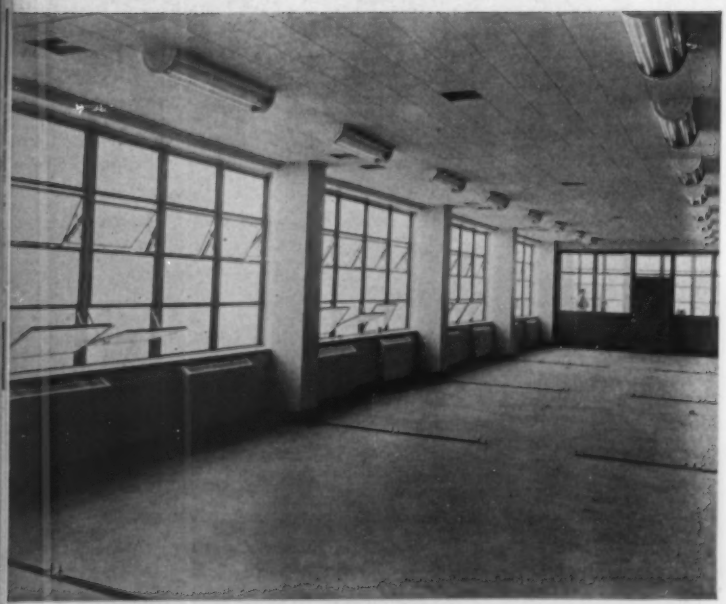
The large picture across-page shows the cooling units for air conditioning in the rear, hot water circulating pumps on the floor and the hot water heaters just under the ceiling in the background.

It is interesting to note that hot water is now completing the cycle in industrial heating. It was used to heat plants in the early days because it was the best available method. Then followed steam heat, and now in general manufacturing areas the preferred installation is in the form of unit heaters mounted in the roof trusses and thermostatically controlled. This method saves space on the production floor and has the advantage of flexibility in that only sections of the plant in actual production need be heated to normal working temperatures.

Hot water, however, has come back not only into general office areas but also into various types of production operations such as aircraft plants and airport hangars. Hot water grids in the floor of an aircraft hangar are feasible because the building is not likely to be adapted to any other purpose. But hot water grids in the floor of a manufacturing area which houses a pattern shop one month and a pressed metal plant the next month are something entirely different. So likely is the floor of a modern manufacturing area to be torn up at any time to provide for new machinery installations—and this necessarily implies tearing up the grid system too—that we question the adaptability of radiant heat for the average, or typical, production area.

Locating the grids in the walls of a *production* area is hardly a satisfactory compromise because of interference by steel girders and the likelihood that the walls, like the floors, may be torn out to make way for new production processes. It seems to us that this hazard more than offsets whatever advantages may be claimed for radiant heat as against truss-installed unit heaters.

In specifying radiant heat for typical *office* structures, we design a two-inch subfloor on which the grids are laid, and a four-inch finished covering. This means that the



Two views which show the clean execution and flexibility of control obtainable with conventional radiators in office areas. Even though the partition brackets (lower view) are moved, at least one radiator remains to every office, adjustable by the occupant. Radiant heating in the floor, say the authors, finds its best use where uniformity is desired over large areas

wall height of the building has to be proportionately increased, and while this is a small item in a one-story structure, most modern office buildings are two or three stories high. The necessary additional wall height for the sub-floor and grid system should properly be charged against the heating system and be entered on the debit side of the ledger against the five to seven per cent fuel saving claimed for radiant heat.

We feel that radiant heat is feasible for open general offices where one uniform temperature is to be maintained for all employees in the general area. For individual offices, however, we believe that individual heating is preferable, and we now have on our design boards plans for new office structures in which radiant heat in the general area is combined with individual heating units, either wall convectors or hot water radiators under the windows, for the executive offices.

We feel that a grid system in the floor of executive offices would not prove satisfactory for the reason that partitions are so often changed and the grid system could not be torn up and altered with each alteration in the floor area, and for the further reason that different executives want different room temperatures which a grid system would not provide.

Our method of meeting the individual desire for self-controlled office heat is to put a radiator or convector under each window, where, regardless of the relocation of partitions, the office occupant can control his own heat supply. The general idea is conveyed by the two photographs on this page. Note the clean installation achieved by concealing piping in wall chases. It is obvious from the lower view that even if the partition brackets pictured on the floor were altered there would still be one or more radiators to service every office area opening on a window.

Hot water has the advantage of providing *constant* heat in extremely flexible form particularly when combined with air conditioning. It also makes possible neater and cleaner installations and more flexible ones in both general and executive offices.

To understand the *pros* and *cons* as we view them at the moment, it is necessary to review the method of installation. In aircraft hangars we have laid the pipe grids on rough concrete or gravel and covered them with a six-inch finished concrete floor. Water is circulated at a maximum temperature of 135° and a maximum floor temperature of 85° is permissible.

Since the heat is radiated from the floor, this method provides warm environmental air down near the floor at the working level when the hangar doors have to be opened in zero weather, and it contributes to quick heat recovery when the doors are closed.

Heat recovery is also hastened by throwing a curtain of warm air across the opening just inside the doors. A row of heaters such as is pictured at the bottom of page 130 is mounted beneath the roof, and additional heaters with powerful fans are located on either side of the door above the floor level. As soon as the doors are opened one foot, the heaters cut in automatically and provide a curtain of hot air inside the door. When the doors are closed the heaters and fans continue to operate until the thermostat is satisfied. This method in combination with radiant heat from the floor has reduced the heat recovery period to a matter of a few minutes even in the coldest temperature.

Above, fluorescent lighting in a monitored daylight plant. In the near future, fluorescent will have to compete with cold cathode. Below, lights in a complete "blackout" plant, giving full control and low maintenance but raising questions of effect

FACTORY DESIGN—

LIGHTING FOR WORK

Actual behavior of employees should determine the kind of lighting disposition to be used. "The requirements may be different in Spring"

INDUSTRIAL lighting will undoubtedly continue making rapid progress.

Instant-start fluorescent tubes and ballasts of a higher wattage than those now available will provide one answer to the plant engineer's dream.

Cold cathode lighting appears now to be the next general step forward and may prove as great an advance over fluorescent lighting for general industrial use as the latter did over incandescent lamps.

Because fluorescent installations were restricted to production areas during the war, undoubtedly many offices and other non-production sections will be switched from incandescent to fluorescent lighting as soon as restrictions are lifted and materials made available. There nevertheless remain some uses for which incandescent lighting still remains the best.

All electrical wiring installations made in war plants or elsewhere under wartime restrictions will need to be surveyed before starting on postwar production for two principal reasons:

1. The War Production Board, in order to spread critical electrical materials as far as possible, prohibited

the installation of standby or secondary feeder equipment which had always been considered desirable in private industrial operation as insurance of continued production in the event of a cable or transformer failure. This did well enough in wartime. If one plant went down because of a power failure, another plant making the same war item was continuing production with the use of equipment which might otherwise have been idle in the first plant as standby, spare, or part of a complete system. When normal civilian production resumes, however, the industrialist will again want the insurance of uninterrupted production which primary and secondary systems provide.

2. To save time and critical materials many war plants, instead of lighting each bay individually, had whole sections of the plant lighting system hooked up to one master switch. Since these plants were designed for full operation day and night, with all departments lighted at all times, this method achieved the desired end of saving manpower and lighting materials. But when such plants are converted to civilian goods, they may operate only one or two shifts, and only certain departments at one time, and obviously lighting the whole plant would be prohibitive in cost.

Some experiments have been made with white painted floors, for their effect on the general lighting scheme. Such floors don't stay white very long and are of dubious value. We do believe, however, that it would reduce the required wattage in a given bay, as well as promote efficiency, morale and cleanliness, to paint machinery in lighter colors. Most machinery is now painted a gray-black in contrast to the white or light colored uniforms in which many plants now clothe their workers. A color chart of reflectance values of various colored paints will show that a gray, lighter in color than machinery gray, reflects only 26 per cent of the light striking it, whereas any of the buff colors reflects 66 to 76 per cent. Obviously the lighter colors would cut lighting costs as an offset to the greater expense of keeping the machinery clean, and there is additionally the intangible value of the psychological effect on the worker.

This psychological effect on the worker is one of the imponderables in any discussion of the relative merits of daylighted and blackout plants. As stated earlier, some industrialists now look more favorably than before the war on the complete blackout plant for postwar civilian production. It should be pointed out, however, that employee reaction to a blackout plant after the war will not be the same as in wartime. In wartime the plants operated day and night, while in peacetime they will operate one or two shifts, seldom more, and mostly in daylight. Our observation has been that it made little difference to night shift workers at any time of the year whether a plant was blacked out or not. Nor did it make much difference in the wintertime to either day or night workers. But there was noticeable restlessness and a let-down of morale among day-shift workers in blackout plants during the warm balmy days of the year.

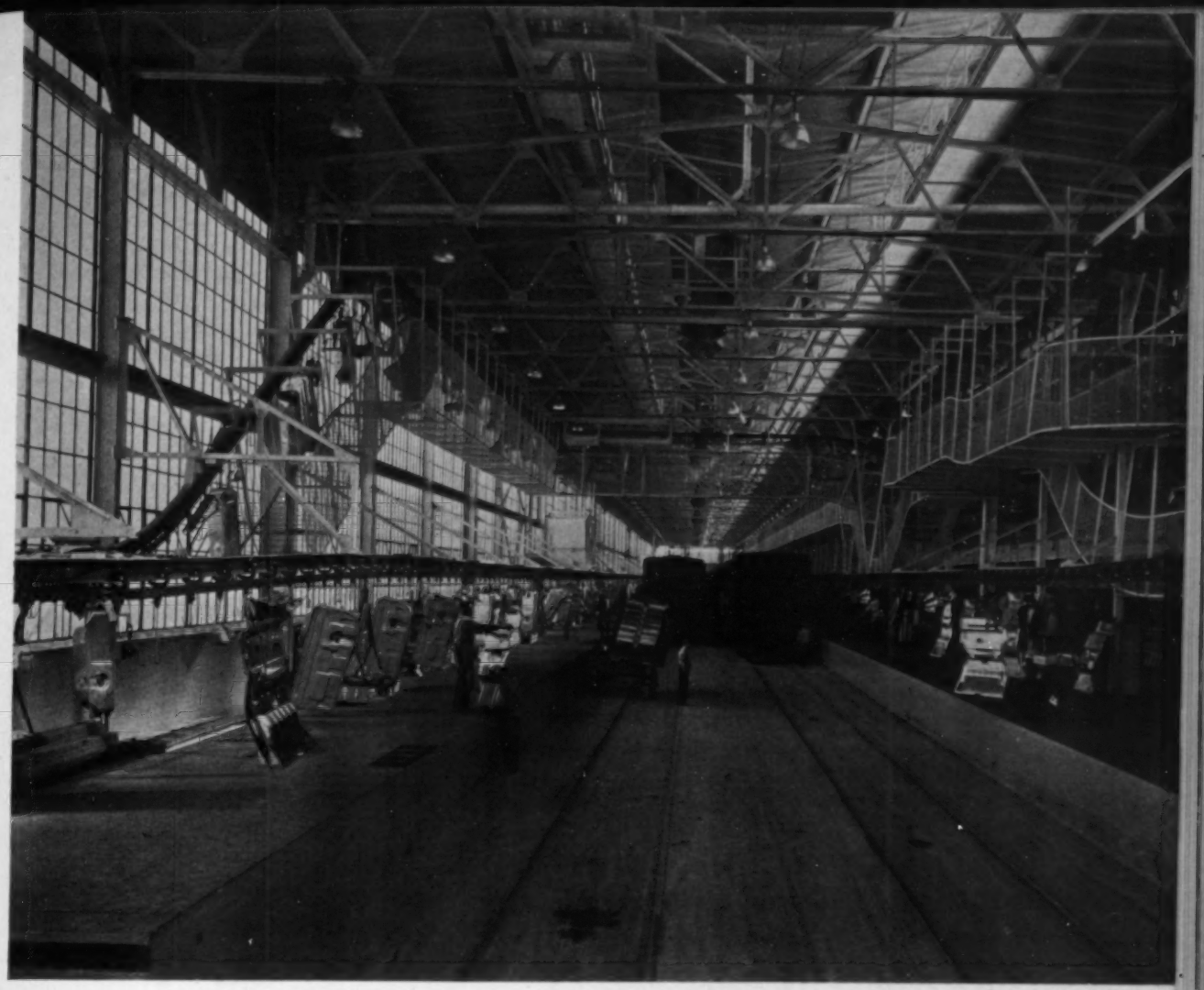
We believe the blackout plant feasible for precision manufacturing operations which require temperature and humidity control. But there is not yet available conclusive data to show that it is practical for other operations, or that the lower maintenance costs will offset the extra investment required in conditioning equipment.

Whether to black out the entire plant or only the roof is another question awaiting more conclusive study. If a plant requires artificial light, it is a question whether the expense of monitors is justified.

If a plant is to be daylighted with monitors, there arise questions as to the use of heat-resisting glass or actinic glass, the design of condensation gutters, the best spacing, the ratio of glass to floor area, light curves, ventilation, and the like.

Every individual project brings up a host of similar matters for consultation and determination between management and the industrial architect. It is the latter's principal function only to advise. If out of a broad background of many years in industrial architecture, he offers no conclusive data in favor of one method as against another, the whims or desires of management can prevail either way without its making much difference in the appearance and efficiency of the completed project.

The new light sources, with lower brightness contrast, are rapidly making possible the high-level even kind of illumination formerly dependent on daylight. Both solutions above are clean. White paper is a splendid diffuser of light



"The trend is to eliminate every possible manual operation in favor of handling by mechanical means." Conveyors bring the product to both sides of the cars

FACTORY DESIGN—

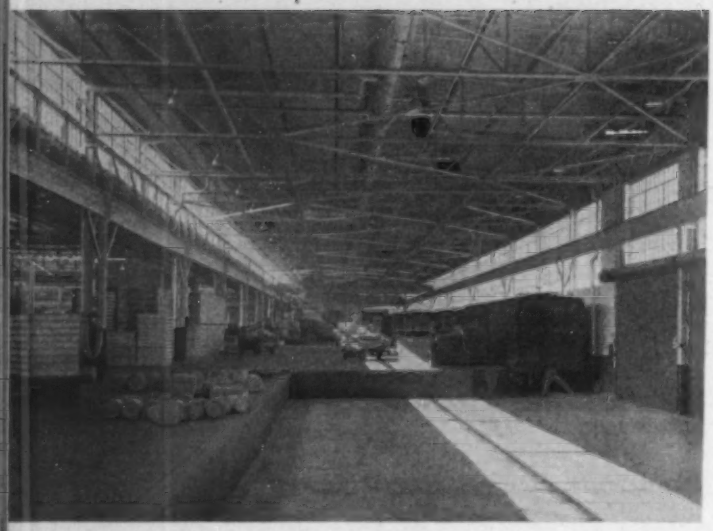
SHIPPING AND RECEIVING

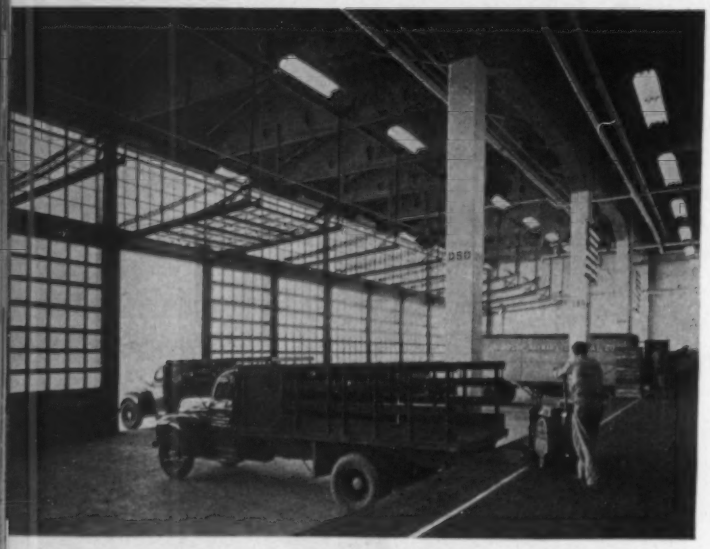
Materials handling in dock areas varies widely, with the same facilities used where possible to ship by rail or truck

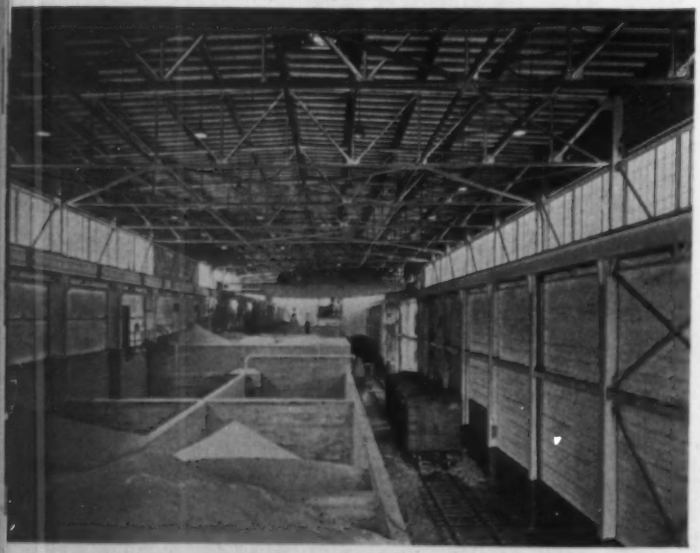
SHIPPING and receiving facilities and materials handling in the dock areas vary so greatly with the individual plant, according to the type and volume of materials handled and the dimensional plot of the dockage area, that few specific recommendations can be made having any general application. Rather than attempt any detailed discussion on this subject, therefore, we show typical illustrations of various installations which have proven satisfactory.

It is axiomatic that materials as received should be brought indoors as quickly as possible. The trend also is to eliminate every possible manual operation in favor of handling by mechanical means. Where shipping is by both rail and truck, as in most industrial plants in the larger projects, there is an obvious saving where the same mechanical equipment can be utilized interchangeably for loading and unloading both types of carriers.

The top picture, next page, illustrates this method in the order and stores building of a larger electrical manufacturer. Railway cars on depressed trackage are serviced from the same docks as the trucks shown in the view, and the overhead craneways are as easily accessible for one type of transportation as the other.







In the views at the left are seen three conditions of shipping and receiving. Top view, depressed rail trackage and truck docks served by the same craneways, permitting alternate use. Center view, right-angle backing of trucks is preferred where there is adequate space; behind the dock is a second set of overhead doors in a partition preserving interior warmth. The bottom view illustrates sand storage in the receiving section of a foundry

Where there is sufficient room, it is preferable to back trucks at right angles to the dock as shown in the middle view, this page. Where room will not permit this, a saw-tooth type of dock will serve the same purpose. Dock height will vary from 3 ft. 4 in. in the receiving section to 4 ft. 6 in. in the loading section. Where trucks are brought in from the outside for unloading, it is desirable to install an inside partition behind the loading dock to conserve heat within the plant.

Sand storage in the receiving section of a foundry, showing the craneways and grab buckets, is pictured in the bottom view.

To keep pedestrian traffic on the production floor at a minimum, elevated walkways such as is shown on page 126 have been used to connect administration and engineering areas with dining rooms and other employee facilities. In this particular instance it was found desirable to add a shield later on the inside of the walkway to prevent swirling skirts above from offering too much of a distraction on the production floor below.

We prefer wood block floors. While more expensive than concrete, they are more comfortable and much easier to repair.

Where employee facilities are located at the basement level, it is important to keep the area above clear of machining operations because of the hazard of oil seepage.

Procedures are best determined on each individual project by joint consultation between plant engineering and the industrial architects in relation to such items as machine foundations, pits, conveyors, trucking aisles, oil leakage and recovery, oil fog precipitrons, humidifying temperature control, stock handling, storing, feeding and control, inspection provisions for light, X-Ray and Magnaflux, baling, chip handling and many others.

PHOTO CREDITS, previous article: Chicago Architectural Photo Co., 128 both. Hedrich-Blessing, 126, 129, 130 all; 134 both; 135 top; 136 both, 138 center. Geo. E. Miller, 138 top. Jim Shepperd, 131, No. 4. Mahony Troast, 125, No. 4; 127. Courtesy Ford Motor Co., 131, No. 1; 135 both; 137. Courtesy Curtiss Wright, 125, No. 2.

NEW IDEAS IN INDUSTRIAL RESTAURANT DESIGN

By Arthur W. Dana, Restaurant Consultant

Under certain conditions, declares Mr. Dana, it is possible to rearrange the customary industrial cafeteria entirely

Bottlenecks in the cafeteria line frequently are the cause of slow service which affects company morale in plants with in-plant feeding.

The counter plan most prevalent today is based on the conventional two-line traffic principle (Fig. 1). The revised plan (Fig. 2) eliminates the two long regimented lines and provides, at a single counter, free access to all stations. A line forms only at the hot-food station.

This unusual layout for in-plant cafeterias depends for its success on certain favorable factors in plant layout and in efficient operation which will appear in our description. Since the type of conversion which is discussed has been done successfully by the author in a number of instances, its value is proved where its adoption is feasible.

Conditions under which the plan was developed were:

PAST AND PRESENT PATRONAGE

		FORMER PATRONS	%	PRESENT PATRONS	%
FORMER PLANT CENSUS	750	350	47	450-500	60-65
PRESENT CENSUS	900	425	47	550-600	60-65

Comparative Traffic Flow

A count of such traffic indicated an average of 35 to 40 during each of the nine five-minute periods during which workers leave their departments for lunch, with the count rising to 70 between 11:55 a. m. and 12 noon. The fact that the several manufacturing departments were located at varying distances, and that lunch hours were staggered, decreased congestion and warranted the use of the "free access" counter.

Studies made over several days indicated that the rate of flow past each of the two cashiers was rarely greater than five a minute, or an aggregate of 10 a minute. The new counter set-up allows a rate of 18 to 20 a minute.

Counter Personnel Requirements

Formerly the counters were staffed with four steam-table servers, three salad and dessert servers, two beverage attendants, one coffee maker and two cashiers—a total of 12 employees. The new arrangement calls for three steam-table attendants, two salad and dessert servers, one beverage server, one utility server and coffee maker, and two cashiers. This cuts the staff to nine, just one instance of the efficiency of the new system.

How Former Factors of Delay in Counter Service Were Remedied

Interruptions that were formerly caused when attendants left their stations for the kitchen to obtain replenishments are now unnecessary because of portable tables which are pushed around to the various stations. Questions such as "Which vegetable?" are no longer asked because customers help themselves to the vegetable dish which they prefer. Improper tools, such as small serving spoons for stew, have been replaced by the correct ones (in this case, ladles), to speed serving.

Patrons who held up the line while they put cream and sugar in their coffee are served coffee and cream already mixed. A bowl of black coffee is on hand for those who prefer it. Sugar consumption diminished, as well as congestion, when patrons were requested to help themselves at a table away from the counter. Ice for iced beverages, which was formerly kept in the refrigerator, is now kept in an insulated ice bin at the counter.

A traffic backwash from among those waiting to pay the cashier interfered formerly with the serving stations, but the cashier is now located 12 ft. from the counters. Delays caused by those who formerly transferred change from hand to pocket or purse are eliminated by the cashier's placing the change on the tray.

RECENT INCREASES IN PRODUCTION VOLUME

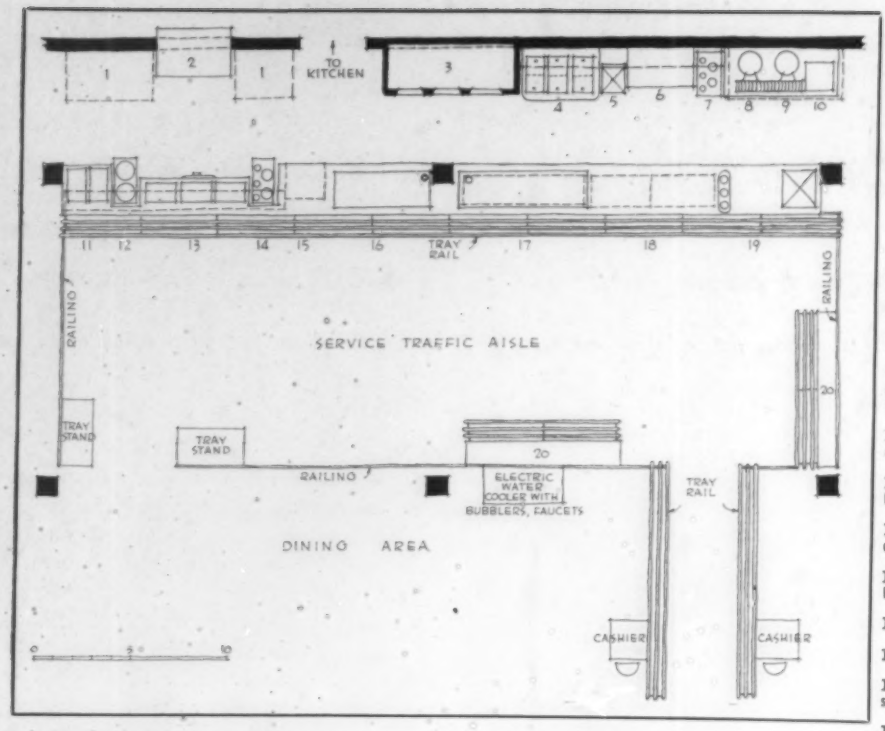
	PAST	PRESENT
PATRONS	350	600

Patrons desiring hot food now line up at the beginning of the counter where there are two 12 by 20 by 4 in. pans interchangeable with other containers for meat, adjacent to a heated portable cabinet containing dinner plates. A second attendant places the potato and gravy on the plate, setting it up on the service shelf in front of the patron. A third attendant dispenses vegetables in side dishes, and soup bowls or cups, and sets these on the service shelf. All hot food table openings have interchangeable panels for flexible use of desired containers. A row of reflector-type infra-red ray lamps suspended over the serving shelf about 12 in. above the displayed plates of food is used to illuminate the plates and also to keep them hot.

The service of sliced roasts is speeded by apportioning them in advance of service between squares of parchment paper. This paper does not disintegrate when wet, and helps to retain heat and the meat juices.

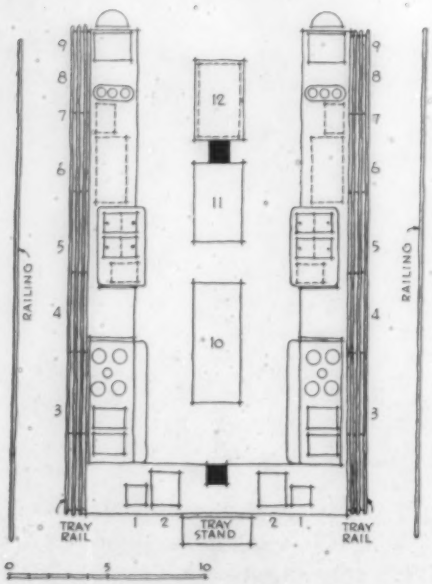
The hot-food patron moves along the tray rail to the bread station where two slices are displayed in glass envelopes. Two bread drawers are shown. A refrigerated cold pan displays trays of butter in paper chips, also cold milk, soda and fruit juices. The hot-food patron leaves the tray rail and returns to the dessert location.

Pies, cakes and puddings are displayed on shelves adjacent to the hot-beverages service. Sandwiches, wrapped, are also stationed together with additional bread for salad patrons on those shelves adjacent to the second cold pan.



LEGEND FOR REVISED COUNTER PLAN

1. Area for the portable plate dispenser cabinets with electric sockets for heating
2. Electrically steam heated food warmer accessible to the kitchen and the counter area
3. Reach-in refrigerator (present one to be used)
4. Ice cream cabinet with shelves above
5. Utility sink with shelves above
6. Utility counter for apportioning desserts, with shelves above and below
7. Portable plate dispenser cabinet
8. 9. 10. Urn stand, with hood above, equipped with one 8-gal. coffee urn, one 5 gal. iced tea urn and one insulated ice storage bin with drain
11. Electric hot food table with two 12"x20" interchangeable panel insets
12. Portable dinner plate dispenser with electric strip heater
13. Electric hot food table with three 12"x20" interchangeable panel insets and serving utensil drawer
14. Portable dispenser for vegetable dishes and soup bowls, with electric strip heater
15. Bread display area with two drawers below
16. Electrically refrigerated cold pan with drain
17. Electrically refrigerated cold pan with drain, display shelves above
18. Dessert display shelves
19. Beverage service area with three-burner electric stove for glass coffee maker, bowl and cup rack dispenser
20. Stand with tray rail, 10 reach-in compartments for silverware and counter top for condiments and napkins



LEGEND FOR ORIGINAL COUNTER PLAN

1. Ice water push back faucet
2. Glass dispenser rack
3. Electric hot food table
4. Counter top for salads
5. Ice cream cabinet
6. Dessert display shelves
7. Wooden shelves for bottled milk and soda
8. Coffee service area with three burner stove for glass coffee maker bowls
9. Cashier's station
10. Elctrically heated reach-down cabinet for plate storage
11. Utility table
12. Shelves for cups
13. Reach-in refrigerator
14. Urn stand with hot water urn and six-unit stove for glass coffee makers
15. Stand for silver boxes and condiments

Butter for this bread, ice cream dispensed slightly in advance in paper souffle cups, and salad plates, fill the second cold pan.

Thus, salad or sandwich patrons, or those supplementing home-made lunches, by-pass the hot-food patrons.

Two condiment and silver stands, with soda-bottle openers and a silver compartment 5 in. wide, 10 in. long and 8 in. high, with a deep incline descending toward the rear, precede two 12-ft. tray rails where cashiers are located.

Tray stands with dispenser equipment, and a water bubbler with two faucets, are at the entrance to the service area. Paper cups are preferred to glass.

The two counter stations which accounted for the most delay—hot food and hot beverages—are located at opposite ends of the counter and are readily by-passed. Each patron has a choice between two cashiers, so that flow past the registers is equalized.

The use of portable plate-stacking cabinets reduces the amount of heavy-plate loading and unloading that is familiar to all cafeteria operators. These cabinets are loaded with clean dishes directly at the dishwashing machine.

The results of reconverting this industrial cafeteria, then, have been successful. Among other things, it has doubled the speed of service, has reduced the number of employees necessary by 25 per cent, and has decreased many of the burdensome tasks of operation.

LABORATORY SERVICE PIPING

Details from plans for Firestone Tire & Rubber Co. Laboratory, Akron, Ohio, by Voorhees, Walker, Foley & Smith, Architects and Engineers

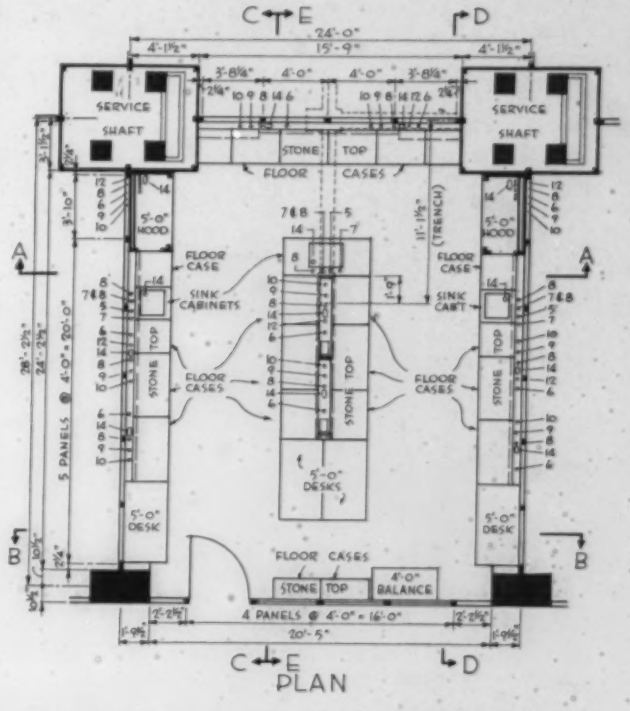
Knottiest problem in a laboratory building is providing all of the many utility services required—electricity, water, gas, vacuum, etc.—making a dozen of them available to laboratory rooms throughout the building, and available to any position within each room. Also to make the system flexible enough for the inevitable changes in use and in utility lines needed. Not to mention keeping the rooms from becoming a clutter of unsightly pipes and temporary connections.

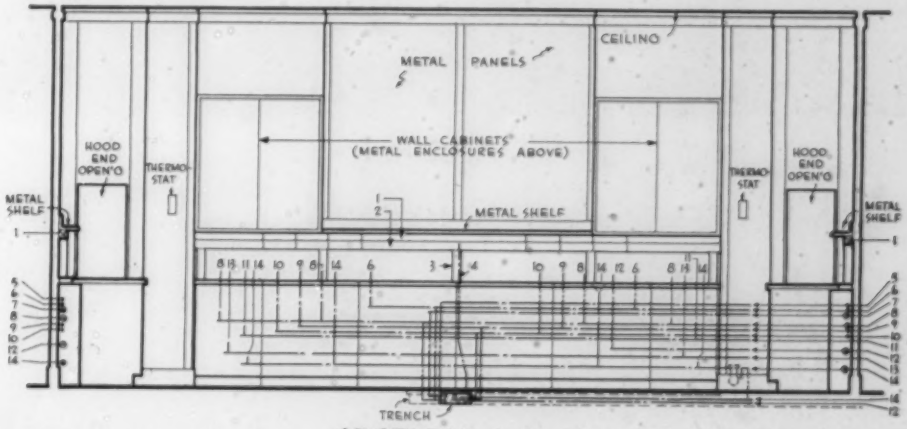
At Firestone's new laboratory in Akron (see also pp. 82-97) the architects went to unusual lengths to achieve maximum flexibility with minimum fuss. Here and on p. 145 are plan and sections of a typical four-man laboratory room

(Continued on p. 145)

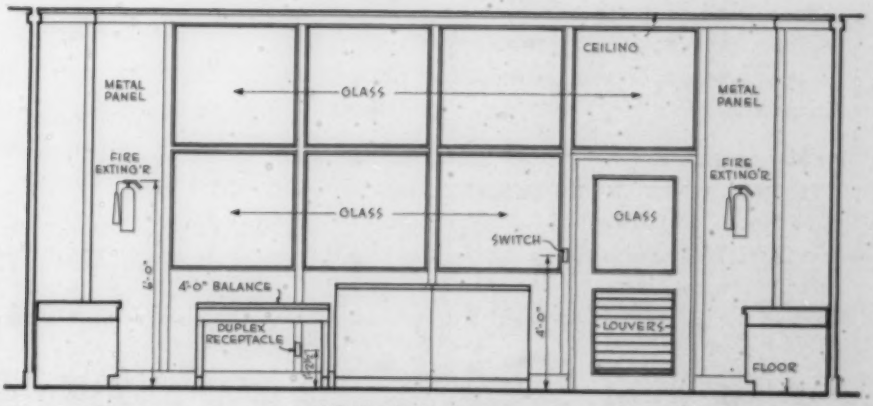
LEGEND FOR SERVICE LINES

1. ELECTRIC TROUGH A.C.
2. ELECTRIC TROUGH D.C.
3. ELECTRIC TROUGH
4. ELECTRIC CONDUIT
5. DISTILLED WATER
6. GAS
7. HOT WATER
8. CHILLED WATER
9. VACUUM
10. AIR AT 100 LBS/SQ.IN.
11. AIR AT 20 LBS/SQ.IN.
12. STEAM - 50 LBS/SQ.IN.
13. STEAM - 160 LBS/SQ.IN.
14. LABORATORY DRAIN



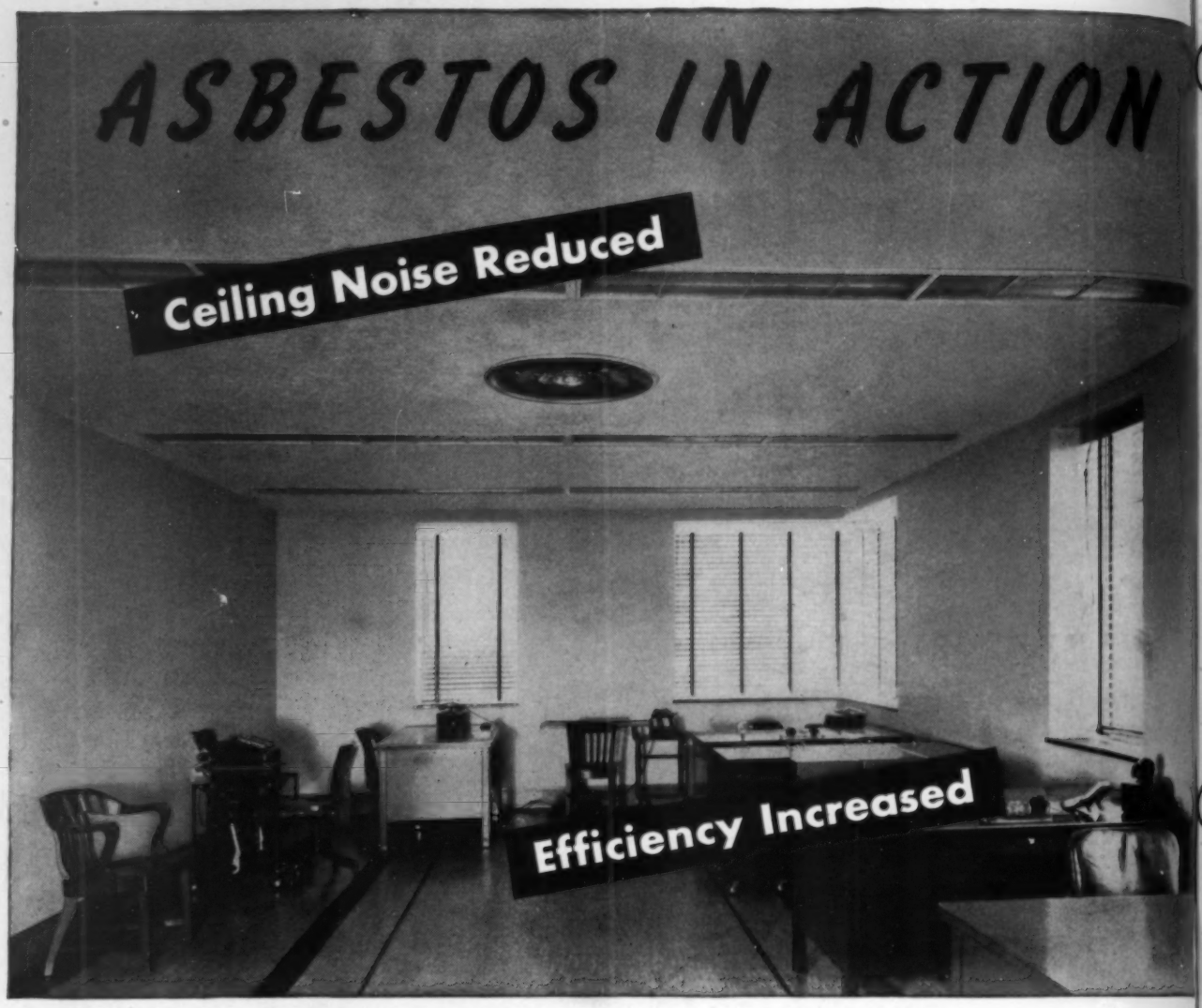


SECTION A-A



SECTION B-B

Sections showing front and rear walls with piping connections. See p. 145 for side walls and center section



Your acoustical problems solved by K&M Sprayed "Limpet" Asbestos

Three and a half years ago a "gun" sprayed a sound absorbing material on the ceiling of this office. Nerve-jangling noises were reduced by 70%. The efficiency of the entire office immediately increased.

This material was K&M Sprayed "Limpet" Asbestos, which, by its porosity, absorbs sound . . . by its diaphragmatic action, reduces it still further. This adaptable acoustical material goes on the most intricate architectural design as easily as plaster. It is ideal for use in offices, restaurants, theatres, lounges—in fact any place where a quiet atmosphere is desirable.

Here are some of the advantages of K&M Sprayed "Limpet" Asbestos:

No cutting or fitting—completely covers, completely insulates—no seams, no joints, no holes.

Easily applied—sticks tight to any clean surface regardless of shape or composition.

High noise reduction coefficient of .70 for a ¾" thickness.

Fire-resistant and heat-insulating—thermal conductivity .31 at 75° F.

Surface may be covered with as many as 10 coats of oil emulsion paint without seriously impairing efficiency.

ARMY E NAVY
K&M best in asbestos

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

LABORATORY SERVICE PIPING

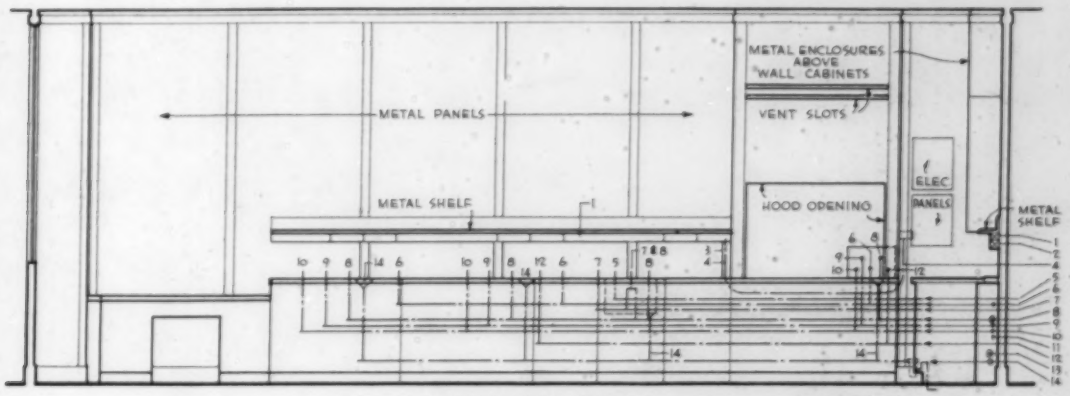
(Continued from p. 143)

showing how the services are brought in. Notice first the service shaft. Instead of the usual single structural column, here are four separate columns, to keep the pipe shaft free of structural elements (detail on p. 93).

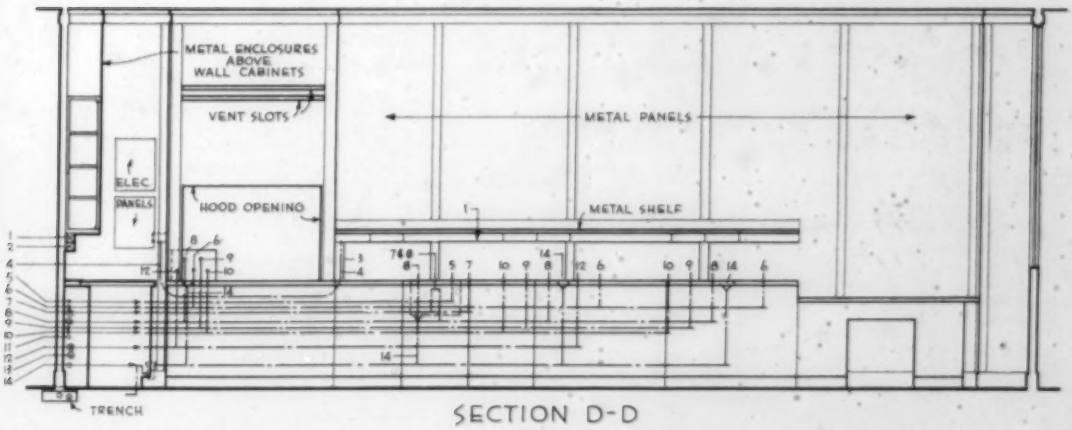
Service lines are taken out of the shaft in three directions (the huge vent shaft takes the fourth side.) The pipes can go out directly along the partitions, or through pipe trenches in the floor to reach positions at the island laboratory tables.

The lines lead, not to the tables themselves, but to narrow service strip cabinets either along the walls, or, for the island positions, between the tables. These narrow strips provide a place for all the piping and wiring to be taken in together. They have demountable steel covers, for quick accessibility to any lines. Even the drains are placed in these cabinets, with tiny cup drains which are often sufficient for sinks. Some of the lab tables require full-size sinks, of course, and for these the drains must be directly connected. Normally, however, the tables do not require piping connections.

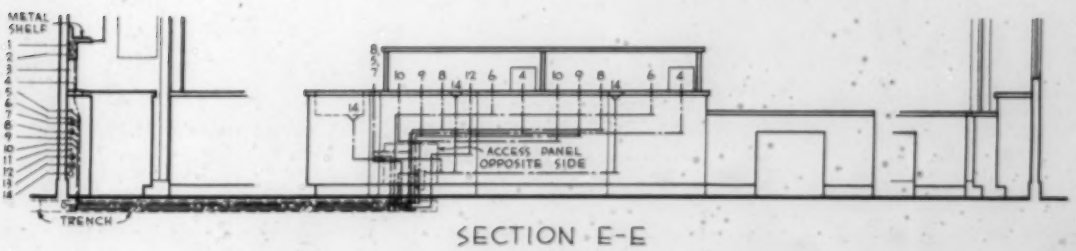
Electric wiring for tables along the partitions comes in above the service cabinet, in two troughs, one for A.C., one for D.C. The troughs have demountable covers with various different arrangements of outlets, so that any desired wiring can be installed. For the island tables the electric lines terminate in boxes on the tops of the service strips; the boxes have demountable covers for outlets.



SECTION C-C



SECTION D-D



SECTION E-E

Now ALL TRANE PRODUCTS ARE BACK AGAIN

How Many of These Heating Veterans Do You Know?

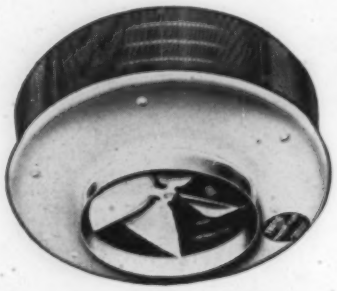
They're back—after almost four years of meritorious service all Trane Heating Products are back again, built with the original materials that Trane designers specified. Again they are available for construction projects of all kinds. For remodeling out-of-date heating plants. For repair and replacement.

And they're better than when they went away. Even though there has been a war, the past five years have been almost normal from the standpoint of product development and improvement. Product refinement has gone on uninterrupted. For example, the Trane Unit Heater of 1945 is better than that produced in 1940, just as the 1940 model was better than the 1935 heater.

Some new products have been added and you want to know about them too.

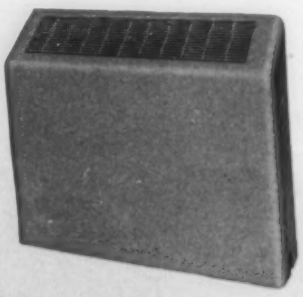
Now, see for yourself how many of the heating veterans and recruits you really know—

Try this Trane Quiz



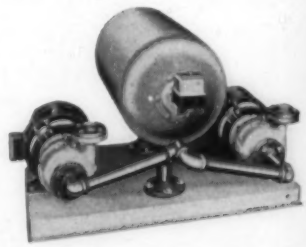
This is a . . . . . ?

Trane Projection Heater—the only new development in the unit heater field in more than fifteen years and one of three types that make the Trane Unit Heater Line the most complete available.



This is a . . . . . ?

Trane Convector-radiator, the modern successor to the old-fashion radiator. Easy to install, clean, attractive in appearance, an ideal heating unit for many applications



This is a . . . . . .

Trane Condensation Pump, one of several different models and sizes which include single and duplex arrangements for uninterrupted and long time service.

This is a . . . . . .

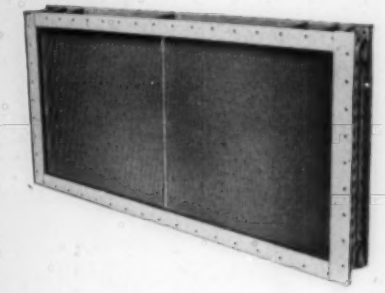
Trane Radiator Valve and Trap, the happy combination that makes any low pressure steam unit work better. Valve truly packless and will last a lifetime. The Trap contains well known Trane Bellows.

This is a . . . . . .

Trane Centrifugal Fan from a wide line including blowers with either forward curved and backwardly inclined blades utility blowers as well as propeller fans, in a wide range of

This is a . . . . . ?

Trane Propeller Type Unit Heater, the conventional heater with the special features which include a quiet broad blade fan, the Trane Coil and directional flow louvers.



This is a . . . . . ?

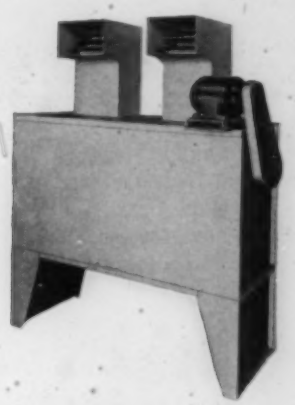
Trane Steam Heating Coil famous for its mechanically bonded fin and tube construction that provides the maximum in heat transfer as well as long life.

This is a . . . . . ?

Trane Bucket Trap, refined during the war into a rugged, trouble-free mechanism to trap maximum condensate and eliminate air in the industrial heating system up to 200 pounds steam pressure.

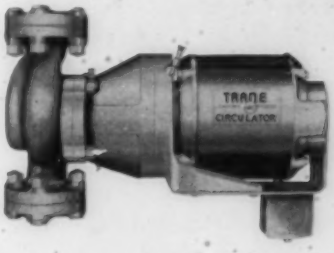
This is a . . . . . ?

Trane Coil for high pressure steam. Instead of the customary cast iron headers, heavy copper pipe welded firmly to the tubes is used to withstand heavy duty operation. Particularly useful for process heating and drying.



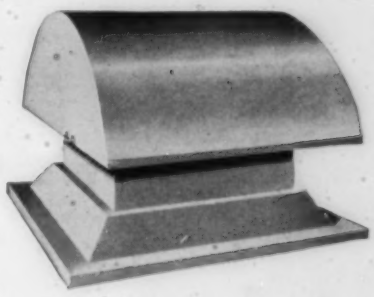
This is a . . . . . ?

Trane Torridor, a blower type unit heater available in three models for free delivery or duct work application. Thousands of sizes and arrangements. Ideal for industrial heating.



This is a . . . . . ?

Trane Circulator, the device that makes the Trane Hot Water System operate smoothly and economically. Handles large quantities of water against high heads. Precision built for vibrationless operation.



This is a . . . . . ?

Trane Roof Ventilator for providing positive ventilation to large building areas. This weather-proof unit is available in two models, one for supply, the other for exhaust. Fits over roof curb in flat or sloping roof.

★ ★ ★

Remember there are plenty of Trane Cooling Products too. All of them are also available for specification now. For complete information on all Trane products see Trane Postwar Products Catalog PB290.

THE TRANE COMPANY

FIRST IN ENGINEERED CLIMATE

MANUFACTURING ENGINEERS OF HEATING, COOLING, AIR CONDITIONING AND AIR HANDLING EQUIPMENT

LA CROSSE, WISCONSIN

Plastic Upholstery

Formerly manufactured from pure rubber and ground leather fibers, the upholstery material known as *U. S. Naugahyde* has had, since the advent of the war, a synthetic vinyl resin compounds base.

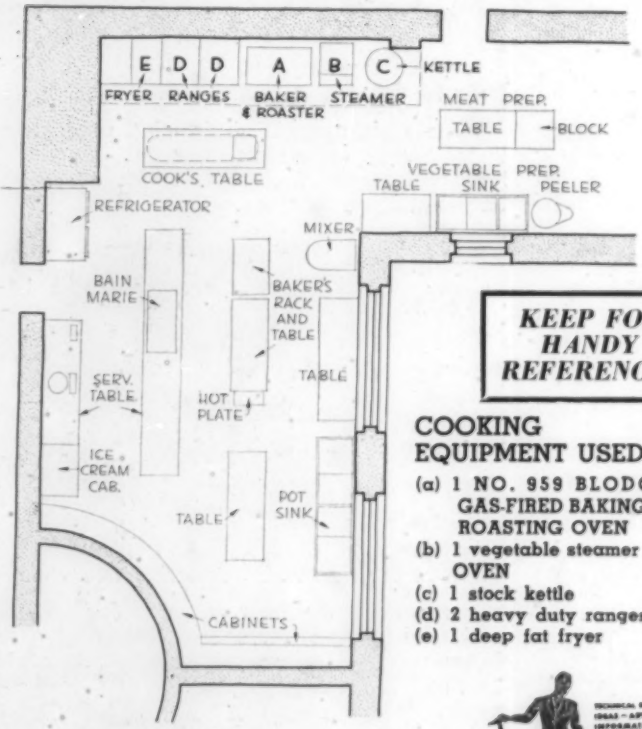
The new plastic Naugahyde is said to be impervious to water, perspiration and alcohol, and highly resistant to fire, acids and alkalies, gasoline, oils and greases. It is unaffected by sunlight, resists abrasive wear and scuffing. The material will be available in a wide range of colors and a variety of finishes. U. S. Rubber Co., Coated Fabrics Division, 407 N. Main St., Mishawaka, Ind.

Awning Fabric

A coated awning fabric, *Textasote G*, a plastic coated duck, is said to be flame resistant, mildew resistant, washable, with excellent aging characteristics. Manufactured in brilliant colors and vivid designs, the new fabrics are also suitable for deck chairs, porch furniture upholstery, luggage, seat covers, etc. The Pantasote Leather Co., 40 Madison Ave., New York City.

KITCHEN PLAN NO. 29: Twenty-ninth of a series of successful mass-feeding kitchen plans.

This installation at Our Lady of Victory Infants Home at Lackawanna, New York, is an excellently conceived small hospital food service unit.



KEEP FOR HANDY REFERENCE!

COOKING EQUIPMENT USED:

(a) 1 NO. 959 BLODGETT GAS-FIRED BAKING AND ROASTING OVEN
(b) 1 vegetable steamer OVEN
(c) 1 stock kettle
(d) 2 heavy duty ranges
(e) 1 deep fat fryer

Designed by: Ruslander & Sons, Inc., Buffalo, New York, for Mortimer J. Murphy, Architect

The NO. 959 BLODGETT GAS-FIRED COMBINATION ROASTING AND BAKING OVEN used in this installation, and handling both baking and roasting in the same unit, has two independent sections: one with two baking decks and one with a single roast compartment. For details and specifications of BLODGETT OVENS, consult your equipment house or write

The G. S. BLODGETT CO., Inc.

53 Maple Street **Burlington, Vermont**

Reprints of this new series will soon be available to architects on request.

Thermopane window-wall, furniture with mirror banding trim in "House of Glass"

"HOUSE OF GLASS"

A novel idea in retail selling is the Macy's-Libbey-Owens-Ford House of Glass which opened in September in Macy's New York store. A permanent department of the store, it features the correlated showing of all types of glass and mirror items. Everything from Thermopane (insulated) windows and vitrolite walls down to a small mirror for a dressing table can be purchased there, complete with full installation service.

Both the selling space and the model rooms adjoining the shop emphasize the useful beauty of glass. The model dining room, for instance, has a window wall of Thermopane; the kitchen, vitrolite walls and cabinets with sliding patterned glass doors.

BUILT-IN RADIO

Designed specifically for built-in installations, the *Ansley Paneltone* is built on a heavy steel panel and requires only 4½ in. of depth. Two models are offered: a seven tube set on a 14 by 14 in. panel furnished in either AC or AC-DC currents and a 17 tube de luxe model giving both FM and regular broadcast reception and requiring only 14 by 26 in. Ansley Radio Corp., Long Island City, N. Y. Paneltone Corp., 1841 Broadway, New York, distributors.

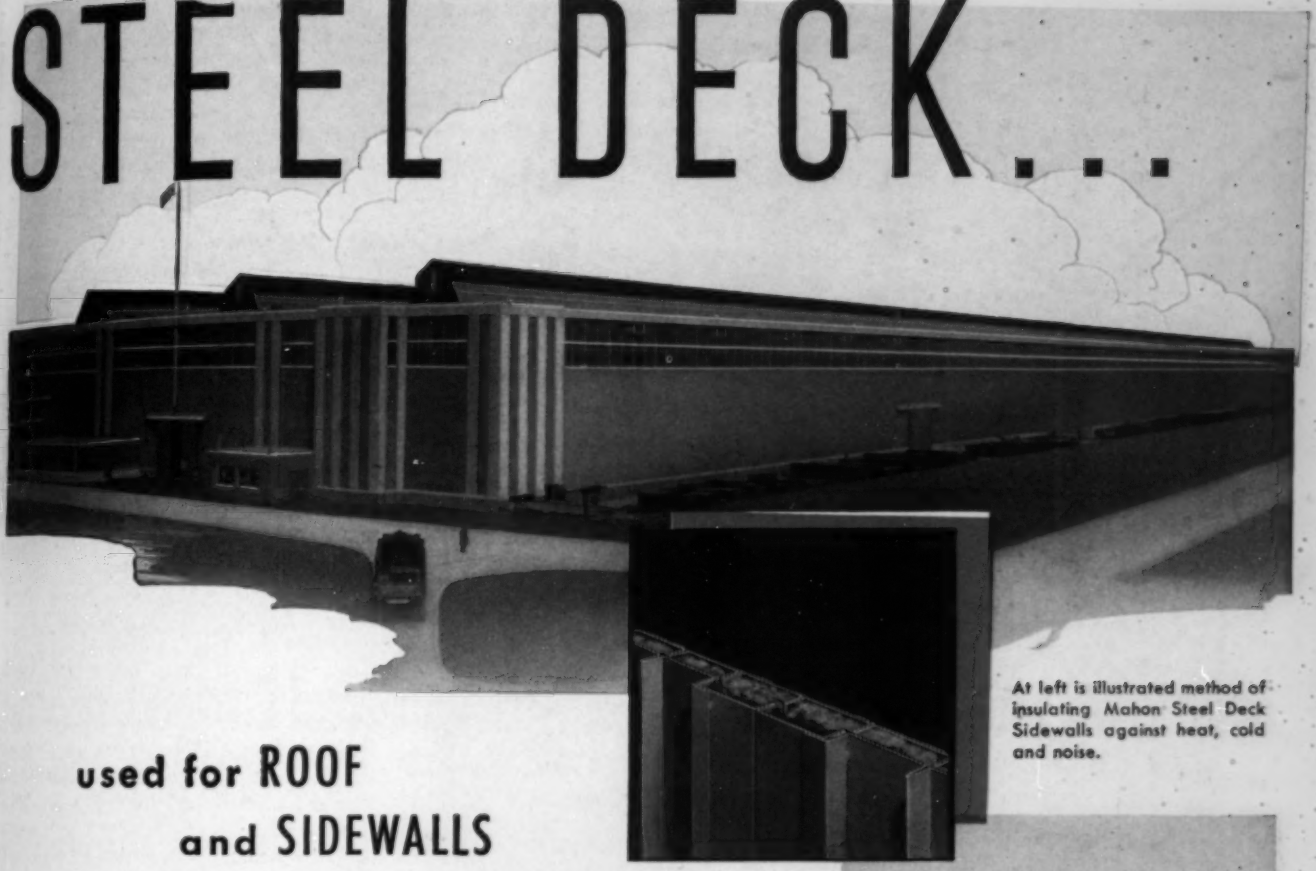
PARTITION PASSES FIRE TEST

An interesting and convincing fire test was made last May by the National Bureau of Standards, Fire Test Section, according to an announcement just made by Commissioner Arthur J. Tuscany of the Metal Lath Manufacturers Assn.

A solid partition of standard design consisting of metal lath and plaster

(Continued on page 150)

STEEL DECK...



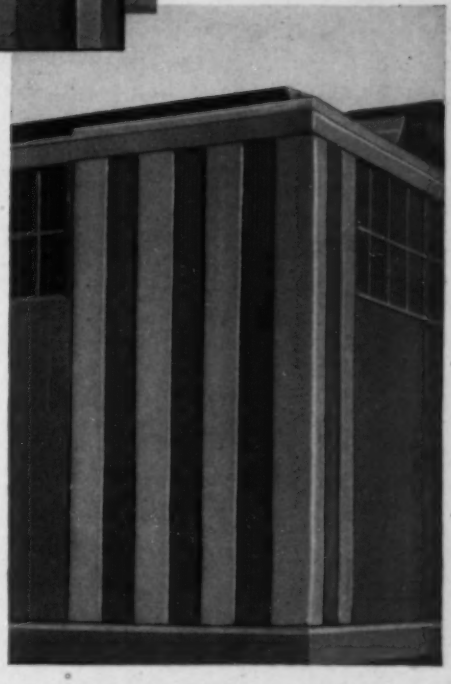
At left is illustrated method of insulating Mahon Steel Deck Sidewalls against heat, cold and noise.

used for ROOF and SIDEWALLS

. . . lends itself to Architectural treatment in Exterior Design

In the construction of this vast industrial plant, Steel Deck was used for Roof and Sidewalls throughout. Sidewall plates were rolled to exact length of 55 feet to eliminate unsightly joints in the exterior wall. Mahon Steel Deck lends itself admirably to several Architectural effects in exterior wall design . . . in addition, it provides permanence and fire-safety in a wall construction that may be insulated to any degree . . . it is economical, and can be quickly erected in the field. Steel Deck is rapidly taking the place of heavier, more cumbersome and costlier building materials. See our insert in Sweet's, or call in a Mahon engineer for complete particulars.

Address inquiries to Steel Deck Division



Pilaster effect illustrated above is obtained by reversing Deck plates so that ribs face in, as opposed to remainder of wall where ribs face out.

THE R. C. MAHON COMPANY

HOME OFFICE AND PLANT—DETROIT 11, MICHIGAN
WESTERN SALES OFFICE—CHICAGO 4, ILLINOIS

Manufacturers of Steel Deck for Roofs, Sidewalls, Ceilings, Floor Forms, Partitions and Doors. Also, Rolling Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Fire Shutters.

MAHON

 (Continued from page 148)

was constructed and used as one wall of a large gas-fired testing furnace. The flames and intensity of the heat to which it was subjected were such as are found in the most vicious of fires.

The technical limit of fire endurance as determined by the temperature rise on the unexposed side was reached a little before the end of the first hour of the test. However, the partition showed the value of the construction as an effective fire barrier for a period in excess of five hours. No cracks appeared to permit the passage of fire. There was no collapse or other structural failure.

COAL CHUTE

A new home coal chute or a metal foundation coal window, the *No. 550*, is made entirely of unbreakable pressed steel, arc welded at corners. The door is of 13 gauge pressed steel, ribbed for added strength and appearance. Hinge supports are of heavy stamping inserted through the back of the frame and through slotted holes and then arc welded. Pressed steel hinges are cured by electronic welding. The body is 16 gauge blue annealed steel with spot welded seams and punched for mortar lock. Finished with a heavy coat of asphaltum, rust-resisting paint. The Majestic Co., Huntington, Ind.

DIRECT FIRED HEATERS

Made entirely of steel, complete, self-contained, and equipped with full automatic control systems, a new line of direct-fired heaters for commercial and industrial applications incorporates several design innovations: (1) the unit is shipped in two sections making possible unloading and placing without heavy crane facilities and entry through much smaller building openings; (2) filters may be applied without special transformations requiring additional floor space; (3) lower resistance through heater provides quieter fan operation and lower motor horsepower; (4) less floor space is required; (5) self-contained automatic thermostatically controlled humidification.

The heaters range in capacities of 75,000 to 2,000,000 Btu output per hour and are available for all types of fuel. Herbert H. Davis Co., Cicero, Ill.

ENAMEL FINISH

A new group of all-synthetic, "hi bake" enamels is said to give an exceptionally hard, stainproof finish designed to endure heavy household usage.

These finishes, called *Synox*, are now being produced in several whites, one of which is designed for refrigerators, deep freeze units, stoves, ironers and electric mixers, and another designed for dishwashers and washing machines. According to the manufacturers, tests have shown that these enamels have an unusual degree of water and alkali resistance, stain resistance and exceptional color retention.

DDT FINISHES

Several types of DDT interior finishes for the control of most insect pests in restaurants, stores, hotels and homes are said to retain their effectiveness for at least a year.

Laboratory and field tests over the past 12 months, the manufacturers report, prove that highly satisfactory control of flies, silverfish and mosquitoes can be obtained with properly formulated DDT finishes. Additional data indicate effective results also

(Continued on page 152)

HOW TO SPEED PRODUCTION *with* SPENCER VACUUM

Any production man with imagination can apply Spencer Vacuum to improve or increase production, in a new way.

Four examples are shown on this page. Air is removed from paper bags before sealing. Bench operators pull dust out of instruments and parts instead of blowing it all over the plant. An engine manufacturer recovers babbitt on the production line, and enamel dust is removed from stencils.

The same Spencer Vacuum machine, portable or stationary, cleans floors, walls, ceilings and machinery better, faster and at less cost. Bulletins on request.

276-C

SPENCER HARTFORD VACUUM CLEANING

THE SPENCER TURBINE COMPANY, HARTFORD 6, CONN.

I.B.M. floor (68,000 sq. ft.) before machine tools were brought in. ANEMOSTATS effectively solved the unusual air-distribution problems presented by the saw-tooth ceiling.

How ANEMOSTAT air-diffus insure I. B. M. top air-conditioning efficiency

Correct air-distribution in this I.B.M. production area is vital to the precision manufacture of International Business Machines.

That's why the architects, engineers, and contractors responsible for the air-conditioning specified 72 wall-type ANEMOSTAT air-diffusers. In this way they got the even, draftless air-distribution required. Temperature and humidity are completely equalized—*without drafts*—to boost production.

IT'S DONE BY EXCLUSIVE PRINCIPLE

Due to its patented design, the ANEMOSTAT distributes air of any duct velocity in a multiplicity of planes traveling in all directions. Simultaneously, it creates a series of counter-currents which siphon *into the device* room-air equal to about 35% of the supply-air, and *therein* mixes the room-air with the supply-air before it is discharged. The ANEMOSTAT effects air expansion within the device, which instantly reduces velocity.

Therefore, the ANEMOSTAT diffuses air of any duct velocity draftlessly, evenly and thoroughly throughout the room, closely equalizes temperature and humidity, and prevents air stratification.

Veteran-ize your personnel!
Many discharged war veterans received valuable technical and specialized training. Always consider veterans when you employ. They did their share —now let's all do ours!

HOW ANEMOSTATS SAVE MONEY

ANEMOSTAT wall or ceiling diffusers permit the use of higher duct velocities and greater temperature differentials. As a result, you gain corresponding reductions in duct sizes and number of duct outlets. Substantial savings in installation and operating costs naturally follow. ANEMOSTATS have no moving parts—never need attention, nor replacement—*never cause callbacks.*

Specify *draftless* ANEMOSTAT air-diffusers for your next air-conditioned industrial building. You'll get predictable, dependable air-distribution . . . your client will get uniform, *production-boosting* air-conditioning. The list of ANEMOSTAT installations reads like the bluebook of American industry. You can have this list—write today for complete ANEMOSTAT details.

ANEMOSTAT

ANEMOSTAT CORPORATION OF AMERICA
10 EAST 39th STREET NEW YORK 16, N. Y.

AC-1026

"NO VENTILATING OR AIR-CONDITIONING SYSTEM IS BETTER THAN ITS AIR-DISTRIBUTION"

 (Continued from page 150)

against most types of ants and cockroaches, clothes moths, carpet beetles, bedbugs, fleas and many of the insects that attack stored food products. Insects have only to crawl across a DDT painted surface to pick up the microscopic quantity necessary to kill them.

The manufacturers will not release the DDT finishes to the consumer until toxicological and service tests prove beyond question their suitability for household and institutional uses. E. I. duPont de Nemours and Co. (Inc.), Wilmington 98, Del.

LIGHTING NEWS

Delayed-Action Switch

A toggle-lever arrangement which, although operated in the standard manner, offers both delayed-action and instantaneous "off," plus a time-selector for the delayed action which can be set at any interval from zero to three minutes, is the feature of a new all-purpose light or power switch called *Tymzit*. T. J. Mudon Co., 1240 Merchandise Mart, Chicago 54, Ill.

New Ballasts

Claimed for a new line of *Amer-Tran Ballasts* for hot and cold cathode fluorescent lighting is an exceptionally close matching with tube characteristics, thus assuring maximum lamp life and maintained brightness. It is also claimed that flicker, end blacking, premature burn-outs are reduced. American Transformer Co., 178 Emmet St., Newark 5, N. J.

Fluorescent Starter

A new *Watch Dog* starter for 15 and 20 watt fluorescent lamps is said to be especially suitable for commercial and residential lighting fixtures.

Bearing the catalog number FS-20, the new starter has all the features of other Watch Dogs, available for 30, 40 and 100 watt fluorescent lamps. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.

Commercial Fluorescent

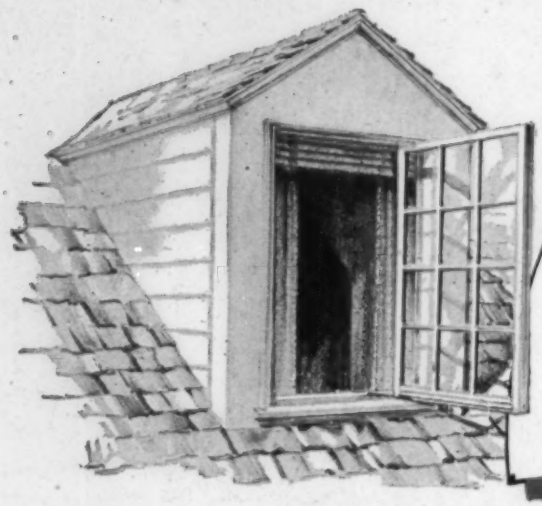
Immediately available is a new commercial fluorescent fixture employing either two or four 20 watt lamps and four or eight 40 watt lamps in 4 or 8 ft. lengths. The 8 ft. fixture is furnished in a single piece body.

Features of the unit are a patented method of positioning lamps on reflector points, doubling reflector surfaces; utilizing the principle of air-draft cooling for ventilating the fixture body and prolonging ballast life; a strongly reinforced steel body equipped with inspection plate that is instantly removable by loosening a single wing nut. Joleco Corp., 2517 Baldwin Ave., St. Louis 6, Mo.

Emergency Lighting System

Designed for instant emergency use when normal electrical current is interrupted, the *Minuteman Light-Warden* is a portable, self-contained unit which automatically floods any protected area with light from its own power. Requiring no special wiring, it can be mounted anywhere—on post bracket, shelf or platform—and plugged in to any convenience outlet.

The instant normal current is resumed, the Minuteman lamps go off automatically and a built-in charger restores power to the storage battery for the next emergency. One lamp head—the unit can be equipped with single or double as desired—is said to be capable of illuminating 10,000 sq. ft. of area for approximately four hours. Electrical Cord Co., 50 Church St., New York 7, N. Y.



3 LIGHTS WIDE CASEMENT UNITS

...thanks to special Pella hinge design and rigid steel frame

Here is a line of casement units with full 28" sash openings. Heights run from 2'-4½" up to 4'-5¼". These attractive stock-size units are helpful in solving many problems of design and proportion.

Pella special design hinges provide an extra long 5½" plate for screwing into the solid wood top and bottom sash rails. Butt plate is *riveted* to the welded steel inner frame of Pella casement units. Hinge extends to allow washing from inside. Tamper-proof when closed. A special mortise and tenon sash joint gives greater gluing surfaces. Joints are also steel-dowelled. Sash is made from genuine White Pine full 1¾" square and toxic-treated. Pre-war installations have demonstrated these 3-light wide Pella casements to be thoroughly practical on all counts.

PELLA 3-LIGHT WIDE SASH easily supports weight of 300 lb. man without springing sash "out-of-true."

Free FOR YOUR FILE!

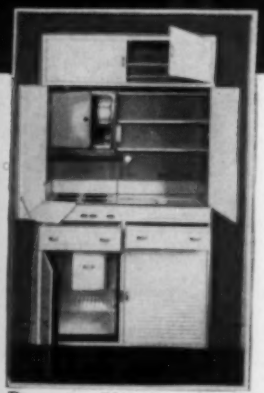
22 separate pages of scaled Pella casement details for all types of installations. Send for your FREE set today. Write: ROLSCREEN COMPANY, Dept. E-115, Pella, Ia.

ROLSCREENS — the original roller-type inside screens. The ultimate in screen efficiency and convenience.

DUAL GLAZING—a single panel type that mounts on inside of sash. Inconspicuous. Easily removed for cleaning.

Pella CASEMENT WINDOWS

Made by makers of Famous Pella ROLSCREENS and Pella VENETIAN BLINDS



Thousands in use and every owner pleased

During the ten years preceding Pearl Harbor this company built an impressive total of Parsons Pureaire Kitchens. Thousands of these Kitchens are today in use in all sections of the United States and in foreign lands.

So far as we know, every Parsons Pureaire Kitchen sold is still in active use.

Every Pureaire owner we have succeeded in contacting is satisfied with his investment.

Each year a larger proportion of our product has been sold to former Pureaire customers.

These facts are PROOF that Pureaire gets and holds tenants—that it increases profits per dollar of investment—that is ADDS TO THE PRESTIGE OF RECOMMENDING ARCHITECTS.

Plan Parsons Pureaire Kitchens into every postwar small-apartment multiple you work on. They will cost little if any more than old-style kitchens.

Save room, save money, build profits with this exclusive, high-quality product.

ARCHITECTS:—Your Sweet's Catalog carries full Pureaire specifications. Or write us.

THE PARSONS COMPANY

15000 OAKLAND • DETROIT 3, MICHIGAN

PARSONS Pureaire KITCHEN

 (Continued from page 14)

week during the three month period from May through July. A substantial increase in this volume may be expected, Mr. Foley said, just as soon as remaining restrictions can be removed and building materials, especially lumber, become available.

RUSSIA REBUILDS

An interesting note on Russia's reconstruction program comes from the Architects' Committee, National Council of American-Soviet Friendship, Inc. Workers who wish to build their own homes will be allocated a plot of land by the factory or enterprise for which they work. Money will be loaned them, technical advice made available, and assistance given in procuring materials. They will be offered standard designs suitable for their needs. The worker himself may do the actual construction with the assistance of specialists such as bricklayers or stone fitters who will be furnished by his factory, or he may pay to have some or all of the work done.

In most multi-family dwellings, living space will be allotted at the rate of about 29 sq. ft. per person. Where possible this will be increased to about 39 sq. ft. Master plans limit the population of Moscow to 5,000,000, and that of Leningrad to 3,500,000.

PENN STATE PLANS HOUSING CONFERENCE

Experts in the fields of housing and heating will pool their knowledge at a conference to be held at the Pennsylvania State College November 14, 15 and 16.

Included on the program will be five sessions dealing with housing needs, basic elements of construction for heating with solid fuels, advances in heating equipment, engineering and research developments, and merchandising trends.

Sponsored by the Division of Fuel Technology of the School of Mineral Industries at Penn State, the conference will be open to anyone interested in heating, housing or fuels. The program includes 20 formal papers, limited to 20 minutes each, followed by audience participation.

Room reservations should be made through Dr. H. B. Charmbury, Mineral Industries Bldg., State College, Pa.

"BETTER HOMES" TO BE DISCUSSED

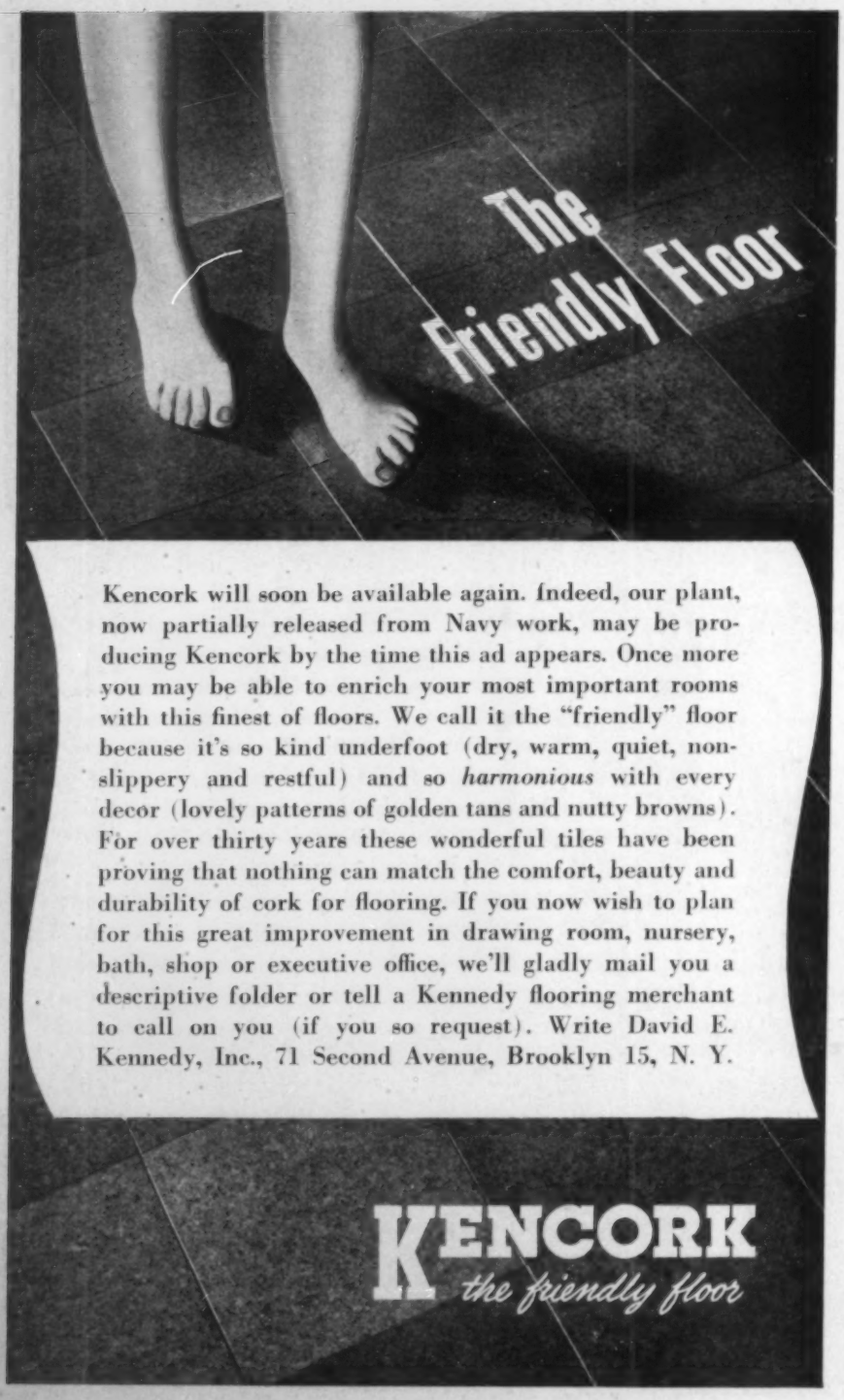
"Better Homes for Better Living" is the theme of a series of lecture-discussions now under way at Town Hall, New York City. Featuring as guest speakers authorities from the housing field, the course of eight 1½-hour Wednesday evening sessions is offered by Town Hall Workshops in cooperation with the Citizens Housing Council. The first meeting was held on October 17.

Mrs. Marian C. Greenberg, a director of the Citizens' Housing Council, is leading the discussions. Guest speakers will include Stanley M. Isaacs, Leon H. Keyserling, Lester B. Granger, John P. Dean, Charles Abrams, William Lescaze, and others.

A.I.A. AIDS VETERANS

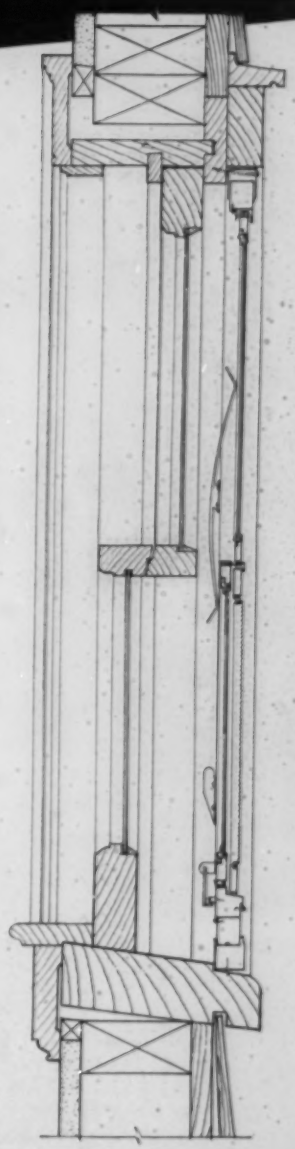
The New York Chapter of the A.I.A. is cooperating with the Educational Division of Camp Upton, Long Island — Army Service Forces Convalescent Hospital of the Second Service Command—in offering a series of classes designed to interest returning soldiers in the possibilities of the building industry as a field of postwar employment, to assist them in the plan-

(Continued on page 156)


The Friendly Floor
Kencork will soon be available again. Indeed, our plant, now partially released from Navy work, may be producing Kencork by the time this ad appears. Once more you may be able to enrich your most important rooms with this finest of floors. We call it the "friendly" floor because it's so kind underfoot (dry, warm, quiet, non-slippery and restful) and so harmonious with every decor (lovely patterns of golden tans and nutty browns). For over thirty years these wonderful tiles have been proving that nothing can match the comfort, beauty and durability of cork for flooring. If you now wish to plan for this great improvement in drawing room, nursery, bath, shop or executive office, we'll gladly mail you a descriptive folder or tell a Kennedy flooring merchant to call on you (if you so request). Write David E. Kennedy, Inc., 71 Second Avenue, Brooklyn 15, N. Y.
KENCORK
the friendly floor

Specify RUSCO

It's your first opportunity to give clients All-Metal Self-Storing Combination Windows!



Nothing to change—nothing to store—seasonal window-work ended forever—RUSCO is the only word you can write into your plans that will give your clients these exclusive, permanent advantages!

Put RUSCO into specifications for homes, hospitals, schools, institutions, office and industrial buildings—and give your clients all these modern benefits:

- patented adjustable closure frame assures tight permanent seal against air leakage
- permanent fuel savings up to ⅓ of annual winter fuel bills
- year 'round rain-proof, draft-free ventilation—even during storms
- self storage that eliminates all changing and storing of insulating sash
- safe, easy operation from *inside*
- light glass and screen inserts that are easily removed for cleaning—from inside
- increased efficiency of air-conditioning systems
- lower maintenance cost

Rusco has served as the first practical Insulating Sash for large buildings since 1937. Now, vastly improved it offers more permanent benefits than ever before. For specifications see Sweet's 18a-7, or write direct for free booklet and name of nearest distributor.

Product of
The F. C. Russell Company
1836-AR Euclid Avenue • Cleveland 15, Ohio

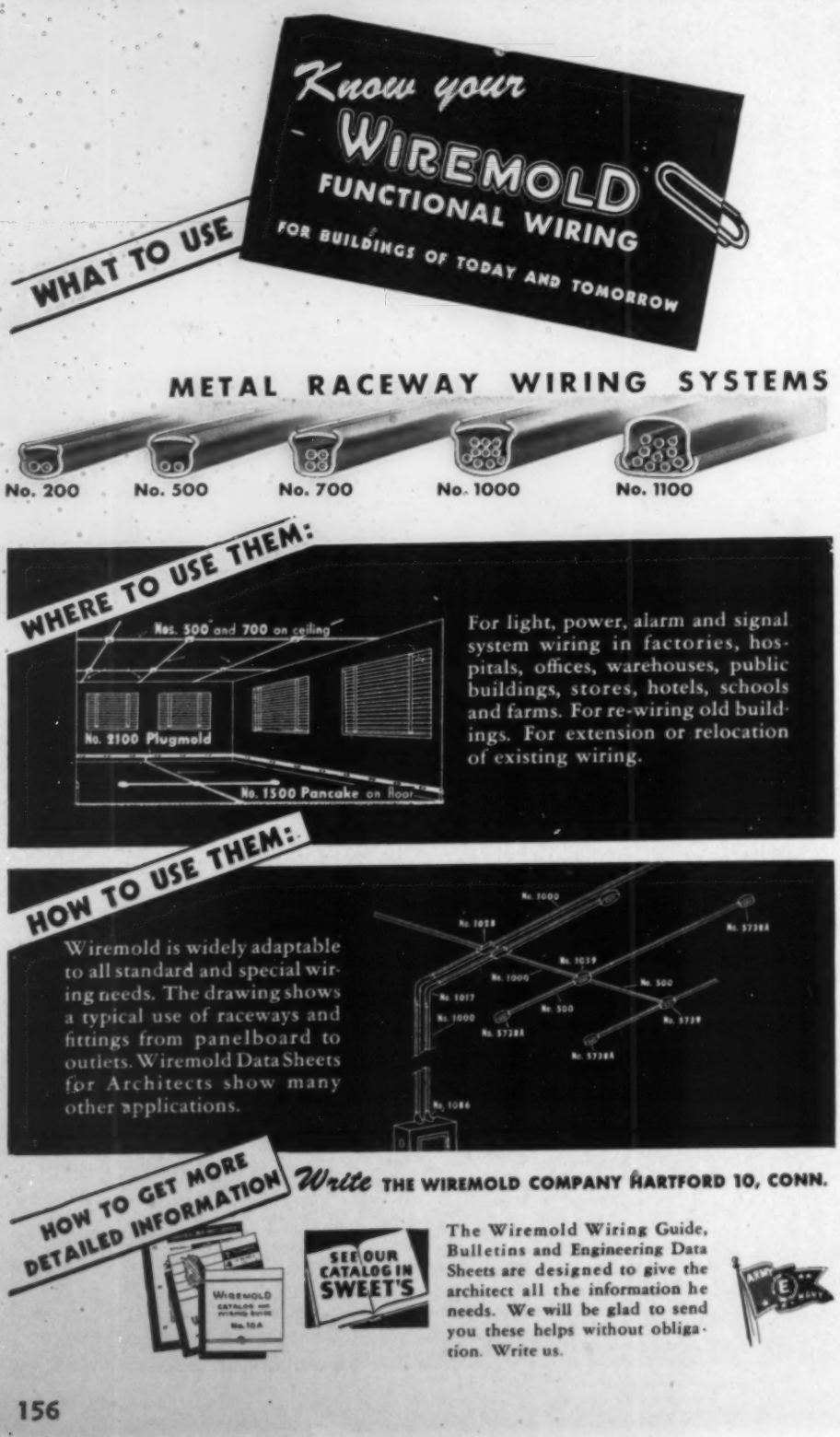
RUSCO

PATENTED ALL-METAL *Self-Storing* COMBINATION WINDOWS

THE RECORD REPORTS (Continued from page 154)

ning of their own homes and to encourage their intelligent participation in the postwar public works development of their local community. The courses will also offer practical instruction in drawing, planning, model making and decorating, and will feature forum discussions.

The New York Chapter is providing the speakers and visiting instructors who will illustrate their talks with slides, illustrations or moving pictures supplemented by exhibits of plans and types of building materials. All patients will be addressed by a qualified speaker once every three weeks; once a week during the intervening periods other Chapter representatives will supervise work of the small classes that are to be formed to take up special studies. Some assignments will be given to develop special aptitudes, and books will be recommended for supplementary reading.


Know your
WIREMOLD
FUNCTIONAL WIRING
FOR BUILDINGS OF TODAY AND TOMORROW
WHAT TO USE
METAL RACEWAY WIRING SYSTEMS
No. 200
No. 500
No. 700
No. 1000
No. 1100
WHERE TO USE THEM:
Nos. 500 and 700 on ceiling
No. 2100 Plugmold
No. 1500 Pancake on floor
For light, power, alarm and signal system wiring in factories, hospitals, offices, warehouses, public buildings, stores, hotels, schools and farms. For re-wiring old buildings. For extension or relocation of existing wiring.
HOW TO USE THEM:
Wiremold is widely adaptable to all standard and special wiring needs. The drawing shows a typical use of raceways and fittings from panelboard to outlets. Wiremold Data Sheets for Architects show many other applications.
HOW TO GET MORE DETAILED INFORMATION
Write THE WIREMOLD COMPANY HARTFORD 10, CONN.
SEE OUR CATALOG IN SWEET'S
The Wiremold Wiring Guide, Bulletins and Engineering Data Sheets are designed to give the architect all the information he needs. We will be glad to send you these helps without obligation. Write us.

CULTURAL COURSES ADDED TO CURRICULA

Five-year curricula, replacing the present four-year programs, in all degree-granting departments of Ohio State University's College of Engineering became effective with the autumn quarter.

The plan, which will bring more of the so-called "cultural" courses into the engineering curricula, became effective with the new freshman class. Students already in residence, returning students whose work was interrupted by the war or for other cause, and students transferring from other colleges are permitted to choose between the four- and five-year curricula, this option continuing for two years. The department of architecture has been requiring five years for graduation since 1929.

The new program will call for 84 quarter hours of fundamental courses, 51 hours of "broadening" studies, 19 hours of required general work, 120 to 126 hours of departmental work. The 51 hours of "broadening" studies may come from such fields as economics, political science, economic geography, business organization.

COMPETITIONS ANNOUNCED

College Dormitories

A nationwide competition to select an architect for a proposed dormitory group has been announced by Smith College, Northampton, Mass. Prizes offered are: first, $2,000 on account toward the winner's fee for services as architect; second, $1,000; third, $500; and ten awards of $100 each for honorable mention.

The competition, conducted under the auspices of *Pencil Points* and the Museum of Modern Art, New York, with Richard Bennett, professor of design at Yale, as professional advisor, will close at midnight, December 10th.

Small Home Designs

The Chicago Tribune has announced a $24,000 competition for small home designs based on the needs of three different typical family groups.

Offering 24 equal prizes of $1,000 each, the competition calls for no specifications or working drawings. Entries are to consist of simple floor plans, perspective, two elevations and a minimum of other detail. Any number of solutions to any or all of the problems may be submitted.

For a copy of the official rules and a registration form, address Chicagoland Prize Homes Competition, Room 1512, 435 N. Michigan Ave., Chicago 11, Ill. The competition closes on December 15.

(Continued on page 158)

Announcing

SISALATION

An efficient Reflective Insulation with all the weather protecting advantages of SISALKRAFT

1 **LOW IN COST** — Only $20.00 for sidewall insulation in the average new 5-room home.

2 **MORE COMFORT IN WINTER** — Heat is reflected in.

3 **MORE COMFORT IN SUMMER** — The same reflective principle that saves fuel in winter keeps homes cooler in summer.

4 **EFFECTIVE MOISTURE-VAPOR BARRIER**—Prevents passage of moisture-vapor into structural materials.

5 **STOPS WIND AND WEATHER** — SISALATION gives Sisalkraft sidewall protection against wind and weather.

6 **SEALS OUT DIRT** — SISALATION helps keep homes cleaner . . . a barrier against dust and dirt.

7 **TOUGH AND STRONG** — Sisalkraft reenforcement of SISALATION insures intact application.

8 **YEAR-IN** and **YEAR-OUT PROTECTION** — SISALATION has long life! Its low first cost is the last.

Never before has an insulating material been perfected that will give so much protection for so little money. In addition to being an effective insulation, it provides a moisture-vapor barrier for little more than the cost of good building paper.

Write us for samples, literature, specifications and architectural data.

A Product of SISALKRAFT

Send Coupon for Samples and Complete Information

The SISALKRAFT Co., Dept. AR, 205 W. Wacker Drive, Chicago 6, Illinois

Please send me samples together with complete information on SISALATION.

Name.....

Address.....

City..... State.....

Range Design

A gas range design competition open to architects, engineers, draftsmen and others, has been announced by the American Stove Co., makers of the Magic Chef gas range. Prizes total $18,000, include a first of $5,000, a second of $3,000. Copies of the program may be secured from George Nelson, A.I.A., *The Architectural Forum*, Dept. M., 350 Fifth Ave., New York 1. The contest closes March 4.

PLANS DISCLOSED FOR NEW OFFICE BUILDING

Plans have been filed for a 33-story office building to be erected between West 51st and West 52nd Streets, just north of Rockefeller Center, New York City. It will be one of the first buildings constructed in compliance with the new zoning regulations.

The building will center on the north end of Rockefeller Plaza, with a frontage of 100 ft. on West 51st Street and 274 ft. on West 52nd St. Containing more than 350,000 sq. ft. of rentable area, it will cost approximately $6,000,000.

New York's proposed new Esso Building

To be known as the Esso Building, the proposed structure will have a limestone exterior and a central tower 90 ft. wide and 127½ ft. in depth that will rise without setbacks to a height of 424 ft. Landscaped roof gardens will extend along both streets at the second floor level. In conformity with the new regulations governing new buildings that cover 100 per cent of the ground area, the plans call for interior loading and garage facilities for tenants.

Architects are Carson & Lundin of New York, with Wallace K Harrison as consulting architect. John W. Harris Associates, Inc., are the contractors. The site has been purchased in the name of the Haswin Corp. of New York.

WHAT OF SUPPLIES?

Lumber

Home and farm construction will be supplied between five and six billion board feet of lumber during the last quarter of this year, if threatened strikes do not halt production, George T. Gerlinger of Portland, Ore., president of the National Lumber Manufacturers Assn., has told Hugh Potter, Coordinator of Construction, Office of War Mobilization and Reconversion.

"Total lumber production today is about equivalent to that of 1940," Mr.

(Continued on page 160)

ANOTHER "MAGIC" TRANSFORMATION WITH— Mo-Sai

REG. U.S. PAT. OFF.

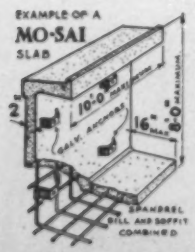
MASONRY FACING SLABS— Colorful Exposed Aggregates

MO-SAI over old brick on Wickert Bldg. Escanaba, Mich. Green base, buff facing, green vitreous letters. Architects: Hubert & Gielsteen. Contractor Mike Rettman. Slabs: Badger Concrete Co.

HERE'S NEW FREEDOM IN DESIGN FOR YOU— *plus structural soundness*

These "thin" pre-cast reinforced concrete units, made of selected aggregates exposed in a matrix of white or colored portland cement, can enchance the appearance and value of existing stores, shops and other buildings. Color is limited only by the aggregates— quartz, granite, ceramics and vitreous. Exposure of the aggregates after casting creates varied and interesting textures.

Slabs up to 100 sq. ft. or more in size; and curves, channels, angles and combinations of returns and reveals can be cast in a single unit. Hooks and anchors for attachment are cast integrally with the slab. Since over-all thickness is only 2 inches, it is often possible to retain existing walls and still stay within building lines. MO-SAI is widely used in both remodeling and new construction.

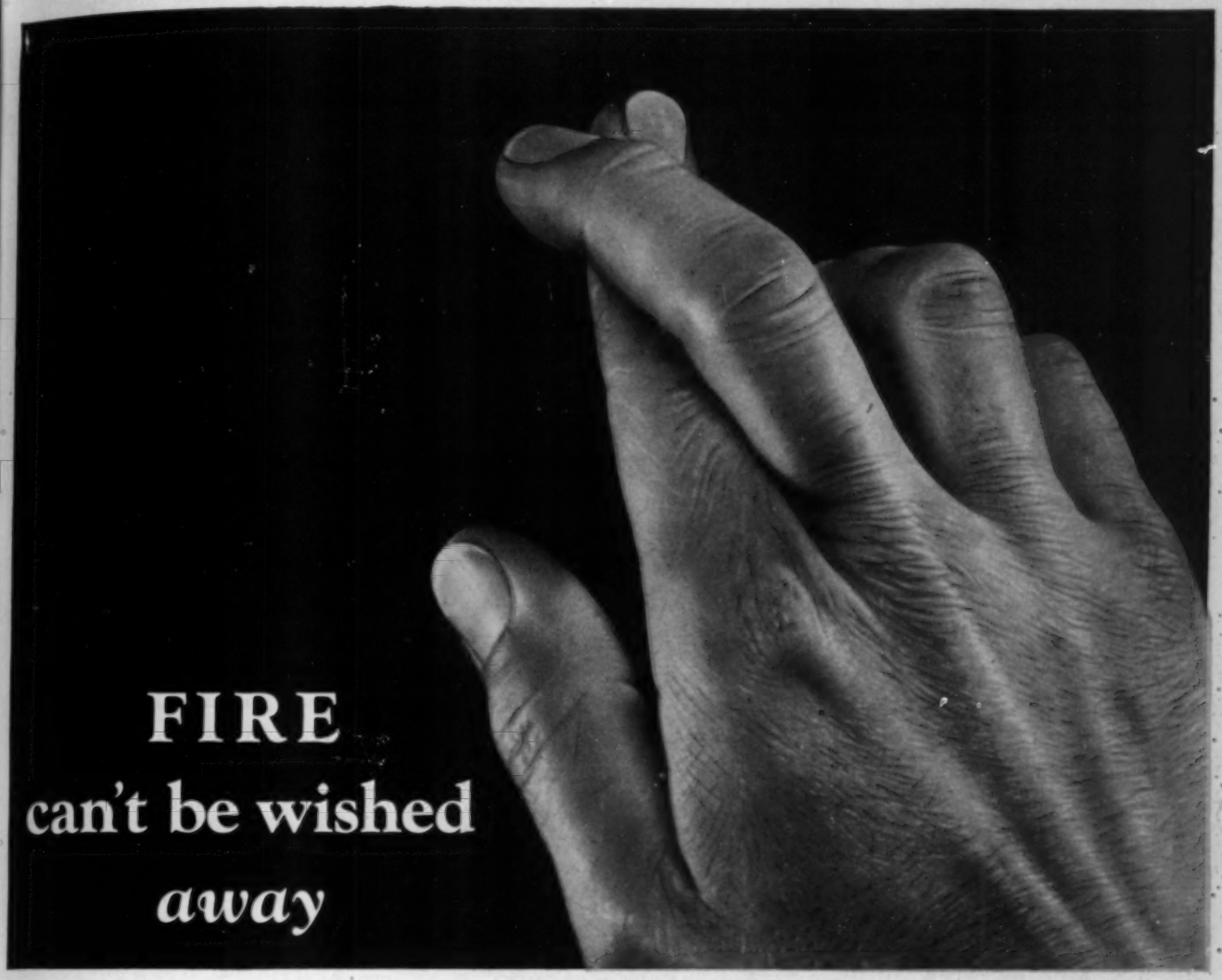


SEE OUR CATALOG IN SWEETS OR CONSULT YOUR NEAREST MO-SAI MANUFACTURER

MO-SAI ASSOCIATES

New Haven, Conn.....The Dextone Co.....P. O. Box 606
Boston, Mass....Cambridge Cement Stone Co.....156 Lincoln St.
Philadelphia, Pa.....Formigli Arch'l Stone Co.....R. E. Trust Bldg.
Richmond, Va.....Economy Cast Stone Co.....P. O. Box 1223
Greensboro, N. C.....Arnold Stone Co., Inc.....P. O. Box 477
Oshkosh, Wisc.....Badger Concrete Co.....191 Marion St.
Salt Lake City, Utah....Otto Buehner & Co. 640 Wilmington Ave.

Mo-Sai MO-SAI ASSOCIATES, founded to standardize and improve architectural slabs. The trade mark "Mo-Sai" Reg. U.S. Pat. Off. is the property of The Dextone Co.



SHEETROCK *Fireproof* WALL *and* CEILING PANELS

Fire takes a yearly toll of 10,000 lives, $300,000,000 in property, untold suffering. Yet, many a building has been erected with only wishes for protection. That's why progressive architects and builders constantly seek safer building materials.

One safer building material is Sheetrock*. For U·S·G makes these big panels of gypsum, a mineral which will not burn. In fire after fire, they have proved their worth, keeping the flame confined till help could arrive.

More, this modern protection adds modern beauty to walls and ceilings. Plan smooth surfaces, sweeping curves or decorative paneled effects, decide on whatever form of decorating you will . . . and Sheetrock will do the job.

Call for wood-grained effects . . . and Sheetrocks offers faithful reproductions of knotty pine, bleached mahogany and walnut. That's why Sheetrock has been used on more walls and ceilings than any other gypsum wallboard in the world.

*Reg. T. M.

United States Gypsum

For Building • For Industry

Gypsum · Lime · Steel · Insulation · Roofing · Paint

Gerlinger said, "and more than 80 per cent is now flowing into normal peacetime channels."

Brick and Tile

The shortage of brick and tile which has been holding up millions of dollars of construction will be ended almost immediately as a result of the recent OPA order increasing ceiling prices on clay products, predicts J. Ernest Fender, president of the Structural Clay Products Institute.

"Many of the nearly 400 plants which were closed have already arranged to reopen, and all-out production is expected within 30 to 60 days," Mr. Fender said.

LE CORBUSIER HAS EXHIBIT

For three weeks late in September and early last month the highly diversified work of the French architect, Le Corbusier, was on exhibition at the International Building in Radio City, New York. Included were models and photographic enlargements of the most important of his architectural designs, nine large oil paintings, 50 water colors and drawings, and many of his books and articles.

Swiss Pavilion, Cité Universitaire, Paris. Le Corbusier & Jeanneret, Architects

Le Corbusier recently was appointed to the Supreme Council of City Planning by the Ministry of Reconstruction. He is to act as general consultant for the restoration of devastated French areas, with specific assignments in the La Rochelle-Palisse region, Algiers and Nemours in North Africa, and the town of St. Die. During the occupation years he was engaged on city-planning research, organizing Ascoral, an all-inclusive organization devoted to architectural studies preliminary to reconstruction. The story of Ascoral's discoveries he has told in full in ten volumes—still awaiting the end of paper shortages for publication.

OFFICE NOTES

Offices Opened and Reopened

Jos. R. Fallon, A.I.A., has reopened his office in the Richmond Property Co. Bldg., 32 S. 9th St., Richmond, Ind.

Herman H. Feldstein, architect, has reopened his offices for the practice of architecture, engineering and industrial design. Address, 305-307 Spitzer Bldg., Toledo, Ohio.

C. Melvin Frank, A.I.A., has reopened his office at 66 E. Broad St., Columbus, Ohio, following several years of service with the FHA and the WPB.

Sanford W. Goin, A.I.A., has re-

(Continued on page 162)

Stop worrying about that

INDUSTRIAL CAFETERIA EQUIPMENT

Turn your floor plans over to Van—and let us do the worrying. We will show you a layout that will put your food service department on a straight line, production basis—save time—cut costs—conserve space.

Then we will design the equipment to fit your client's needs—build every unit for years of low cost, heavy duty service—install the job and supervise the related work of other crafts.

• Send us your inquiries

The John Van Range Co.

EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD

429 CULVERT STREET CINCINNATI 2, OHIO

North American Aviation Inc., Dallas, Texas

Architect and Engineer: J. Gordon Turnbull, Cleveland, Ohio and Dallas, Texas.

General Contractor: James Stewart and Company, Inc., New York, N. Y. and Dallas, Texas

Mechanical Contractor: C. Wallace Plumbing Company, Dallas, Texas.

67 ACRES UNDER ROOF

DESIGN FOR AMERICAN AIR SUPREMACY

DRAINS AND INTERCEPTORS BY Josam

In the darkest days of the war, America perfected its way to victory. For in spite of what the enemy had in reserve, American Air Supremacy was a predetermined fact when the foundation was laid for such aircraft plants as North American Aviation, Inc., at Dallas, Texas. With 67 acres under roof, this one factory surpassing the imagination, broke record after record in fighter plane production—a proud achievement for the men who built the plant and for the men who supervised its great facilities.

At North American Aviation, Inc., as in other equally notable projects throughout the United States, the drains in these almost limitless buildings, from roof to floor, and the grease interceptors throughout were Josam. Here is powerful, realistic proof of the ability of Josam Products not only to meet rigid requirements on schedule by means of advanced features of installation. That's what building men mean when they say: "There are no substitutes for Josam Products"!

North American's Dallas Plant, A DESIGN for PRODUCTION

Sixty-seven acres under roof—windowless and air-conditioned.

•

More than 2500 machine tools in operation; more than 39,000 employees at peak production.

•

Two main buildings, 11 auxiliary buildings, all of steel, concrete or masonry construction, 125 acres of concrete ramps and parking aprons.

•

More than 24,000 airplanes produced in 52 months plus an all-time record of 752 delivered in a single month!

ONE ACHIEVEMENT DEPENDS ON ANOTHER . . . TO BE SURE, PUT JOSAM ON THE JOB!

Josam PRODUCTS STANDARD OF AMERICA ESTABLISHED • 1916

JOSAM MANUFACTURING COMPANY

Executive Offices, 302 Empire Bldg., Cleveland 14, O. • Manufacturing Division, Michigan City, Ind.

Representatives in all Principal Cities

JOSAM-PACIFIC CO., 785 Folsom Street, San Francisco, California — *West Coast Distributors*
EMPIRE BRASS COMPANY, LTD., London, Ontario — *Canadian Distributors*

ORIGINATORS AND MANUFACTURERS OF:

Roof Drains · Grease Interceptors · Backwater Sewer Valves
Floor Drains · Oil Interceptors · Shock Absorbers

See our Catalog in Sweet's. *Member of the Producer's Council*

opened his office for the general practice of architecture at 230 E. Main St., S., Gainesville, Fla.

F. Arthur Hazard, architect, Augusta, Ga., announces the opening of a branch office at 11 Johnson Bldg., 332 W. University Ave., Gainesville, Fla.

Robert S. Loney, Major AUS, has just received his discharge after serving 3½ years in the Army. He is opening an office at 2518 N. Columbus St., Arlington, Va., for the general practice of architecture, with emphasis on residential work.

Nat O. Matson, A.I.A., has reopened his offices at 171 E. Post Rd., White Plains, N. Y.

John Jacob Mattern, Jr., A.I.A., has announced the opening of his offices for the practice of architecture at 110 N. 7th St., Richmond, Va.

I. Wm. Ricciuti announces his return to the practice of architecture, with offices in the Queen & Crescent Bldg., New Orleans 12, La.

William J. Rush, architect-engineer, announces the opening of offices for the general practice of architecture in the Kresge Bldg., Ann Arbor, Mich.

New Addresses

The following new addresses have been announced:

Boris W. Dorfman, architect, 44 Court St., Brooklyn 2, N. Y.

Jones and Marsh, architects, Concord Bldg., 208 S. W. Stark St., Portland 4, Ore.

Guy Francis Lamb, architect, 252 Main St., Middletown, Conn.

Francis Joseph McCarthy, A.I.A., 693 Mission St., San Francisco 5, Calif.

Leo Stillman, architect, 332 E. 149th St., New York 51, N. Y.

Walter Wagner, architect and engineer, Bank of America Bldg., Fresno, Calif.

C. E. Waltman & Associates, 165 E. Chicago Ave., Chicago 11, Ill.

Firm Changes

James W. Adams has been appointed chief engineer in charge of the airport work of McLaughlin-Carr Associates, 80 W. 40th St., New York City.

Ragnar L. Arnesen is now on the staff of William J. Rush, architect-engineer, in charge of architectural design. Address, Kresge Bldg., Ann Arbor, Mich.

Lt. Col. Robbins L. Conn, late of the Army of the United States, is now associated with Lorimer Rich, architect, at 215 Montague St., Brooklyn, N. Y.

Edward G. Conrad, J. Byers Hays, Russell Simpson and Paul C. Ruth announce the consolidation of their offices for the practice of architecture under the firm name of Conrad, Hays, Simpson & Ruth. Address, 1110 Hanna Bldg., Cleveland 15, Ohio.

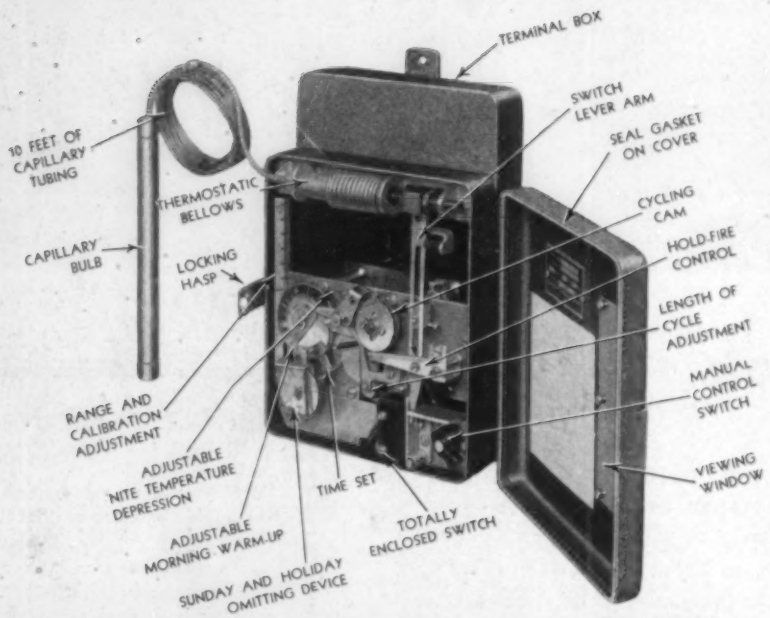
J. W. Crenshaw, engineer, and Albert H. Jost, architect, announce the organizing of the engineering and architectural partnership of Crenshaw and Jost, as successors of The Kinsey Engineering Co., with offices at 512 Court St., Pekin, Ill.

Byron F. Dixon and John W. Slater, Jr., announce the formation of a partnership to represent business organizations in their relations with the federal government in Washington, under the name of Manufacturers Service Agency. Address, Hibbs Bldg., Washington 5, D. C.

Harold T. English, A.I.A., Ken G. Miller, A.I.A., and Ray L. Hockett, Assoc. M., A.S.C.E., announce their association for the general practice of architecture and engineering under the firm name of English, Miller & Hock-

(Continued on page 164)

MAXIMUM FUEL SAVINGS



Pat. applied for

BARBER-COLMAN
Econostat

This efficient, durable, and highly flexible instrument is designed to control the operation of a motor-driven valve (with central steam plant heat supply) or an oil or gas burner or stoker (where the building has its own heating system) so as to regulate the heating of a building *in accordance with changes in outdoor temperature* by supplying heat at intervals. It will avoid overheating and maintain more uniform temperature — thus achieving *maximum fuel savings.* Simple adjustments cover length of cycle, operating range, calibration, night temperature depression, and morning warm-up to suit individual building conditions. *A new circular gives complete details—get it from your Barber-Colman representative.*

BARBER-COLMAN COMPANY
1232 ROCK STREET • ROCKFORD, ILLINOIS

FAIRVIEW SCHOOL
Springfield, Missouri
C. A. BISSMAN R. P. STAHL
Architects
McCARTY
PLUMBING and HEATING CO.
Heating Contractor

BYERS RADIANT HEATING goes to *School* again . . .

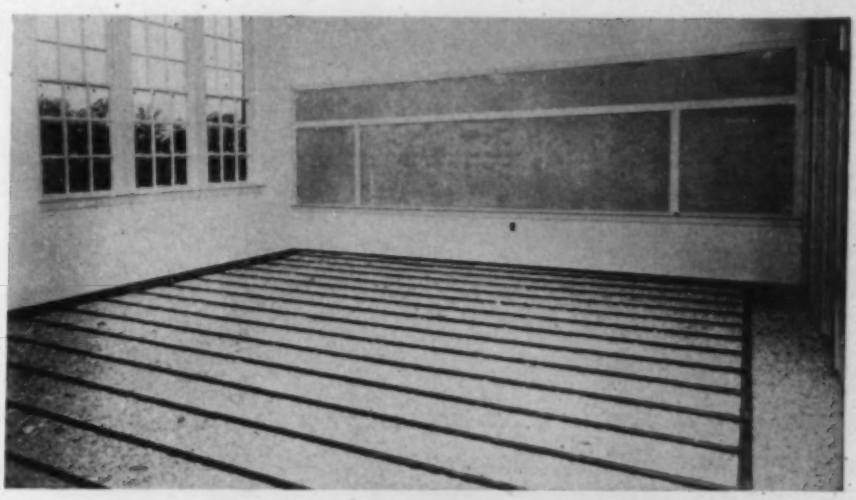
Replacing a building which burned, this new Fairview School is a one-story, basementless structure, founded on a concrete slab. It has three school rooms, a cafeteria and a small boiler room, and it serves a country district in the Springfield area. Cost was approximately $25,000.

Byers Wrought Iron pipe was fabricated into pipe grids by welding, laid on a gravel bed, and covered with a concrete topping. Hot water from the heating boiler is circulated by thermostat-controlled pump.

This last winter provided a severe test. Only 16 tons of coal were used for practically the entire season. The heat was first turned on on a Friday, when the building was still cold and damp from the new plaster and concrete. On Monday morning when the children came in after playing in the snow, the rooms were warm and comfortable.

This is one of several recent Byers Radiant Heating Installations in schools, which provide an excellent "laboratory" for anyone who has school jobs on the boards or in prospect. In addition to the obvious advantages of space-saving, elimination of torrid and frigid zones, and the removal of safety hazards, Byers Radiant Heating is the only heating system that solves the cold-floor problem, and so permits the use of basementless construction with its attendant economies.

These installations, like a thousand others, also demonstrate the essential contribution made by Byers Wrought Iron. The material is easily formed and welded. It expands and contracts at practically identical rates with concrete and plaster, eliminating the danger of thermal cracks. It has a high rate of heat emission. And its corrosion resistance—a vital requirement—has been conclusively demonstrated.



Byers Wrought Iron pipe grid in classroom

The completed classroom—all area usable

Our new technical bulletin, "Byers Wrought Iron for Radiant Heating," said to be the most complete and comprehensive treatment of the subject ever put between two covers, is just recently off the press. Would you like a copy?

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE ALLOY STEELS · OPEN HEARTH ALLOY STEELS
CARBON STEEL MISCELLANEOUS PRODUCTS

ett, with offices at 206 Woolworth Bldg., Hutchinson, Kansas.

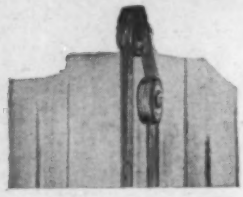
Harold Guy, formerly of B. Altman & Co., New York, and John H. Meyer, formerly with the Army Service Forces, Washington, have joined Robert Heller Associates, Inc., 2 W. 46th St., New York 17, N. Y.

Rowena Steele, coordinator of home furnishings, is leaving Hearns Department Store to join Gladys Miller's New York office at 535 Fifth Ave. She will specialize in the modernization of stores, shops and hotels.

Walter Dorwin Teague, industrial designer, announces that he has taken into partnership two of his associates, Robert J. Harper, director of design in the New York office, and C. Stowe Myers, who has the same position in the Los Angeles office.

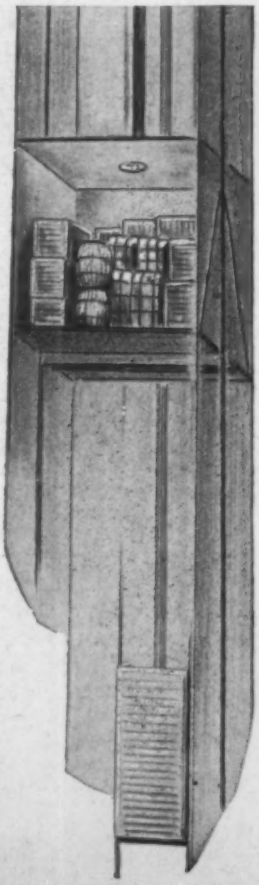
Ralph M. Rice, Alexander C. Youngson and Roland M. Ellis announce the formation of a partnership for the purpose of jointly engaging in the practice of architecture and engineering under the firm name of Rice, Youngson & Ellis. Address, 140 Cedar St. (90 West St.), New York 6. N. Y.

FREIGHT ELEVATORS



by Sedgwick

THESE NEW SEDGWICK ELECTRIC ELEVATORS ARE EXPRESSLY DESIGNED FOR FREIGHT USE—ENGINEERED FOR RUGGED, WORK-A-DAY SERVICE MOVING MATERIAL AND MERCHANDISE WITHOUT BREAKDOWN, WITH MINIMUM MAINTENANCE.



These simple, hard working freight elevators are the result of more than 50 years' experience manufacturing elevators and dumb waiters—electric and hand power—plus the knowledge gained from wartime production of airplane elevators, freight and passenger elevators and galley dumb waiters for the Navy, Coast Guard and Merchant Marine.

SEDGWICK FREIGHT ELEVATORS OFFER MANY ADVANTAGES

1. Worm geared V-groove traction machines with *internal helical gearing.*
2. Self-aligning motor mountings.
3. Special, heavy duty motors.
4. Special steel gear and sheave shafts.
5. Anti-friction bearings.

And Sedgwick Electric Freight Elevators are manufactured in many sizes and capacities. They can be built to lift loads weighing well over 100,000 lbs. or loads of 2500 lbs. or less.

SEDGWICK MANUFACTURES COMPLETE LINE OF VERTICAL TRANSPORTATION EQUIPMENT

In addition to Electric Freight Elevators, Sedgwick makes a complete line of electric and hand power passenger, hospital, residence and sidewalk elevators and electric and hand power dumb waiters—all engineered to solve "man" handling and materials handling problems through greater operating efficiency.

WRITE FOR YOUR COPY OF SEDGWICK'S NEW SPECIFICATION BOOK

If you have not yet received your copy of the 24-page ready reference booklet, "Sedgwick Standard Specifications for Elevators and Dumb Waiters," *write for it today.*

And if you are stymied by perplexing lifting and lowering problems—*tell us about them.* Our engineering staff is at your service *now* ready to help and show you how Sedgwick Freight Elevators—fact is, all Sedgwick elevators and dumb waiters—reduce costs by increasing "man" handling and materials handling efficiency.

SEDGWICK MACHINE WORKS, 142 W. 15th St., New York 11, N. Y.

ELEVATORS • ROTO-WAITERS • DUMB WAITERS • SPECIAL LIFTS

APPOINTMENTS

Housing Manager

Earl E. Burkhard, real estate management expert with a long background of both public and private housing management, has been appointed General Housing Manager for the Chicago Housing Authority. He will have charge of the management program for Chicago's 10 public housing developments.

Professor of Architecture

Henry L. Kamphoefner is now professor of architecture in the University of Oklahoma.

Construction Committee Head

Ken Winebrenner, for the past year on the department's executive staff, has been appointed manager of the Los Angles Chamber of Commerce Construction Industries Committee.

Mr. Winebrenner, formerly engaged in architectural design and construction supervision, said that part of the department's future policy will be to relieve the housing shortage by encouraging erection of homes and other living units as rapidly as materials become available.

DRAPER RESIGNS

Earle S. Draper, Deputy Commissioner of the Federal Housing Administration, has retired from government service to enter private business in Washington. His resignation became effective on September 30.

Mr. Draper, who has been connected with FHA for more than five years, plans to establish offices in Washington as a consultant in city and land planning, housing construction and housing finance.

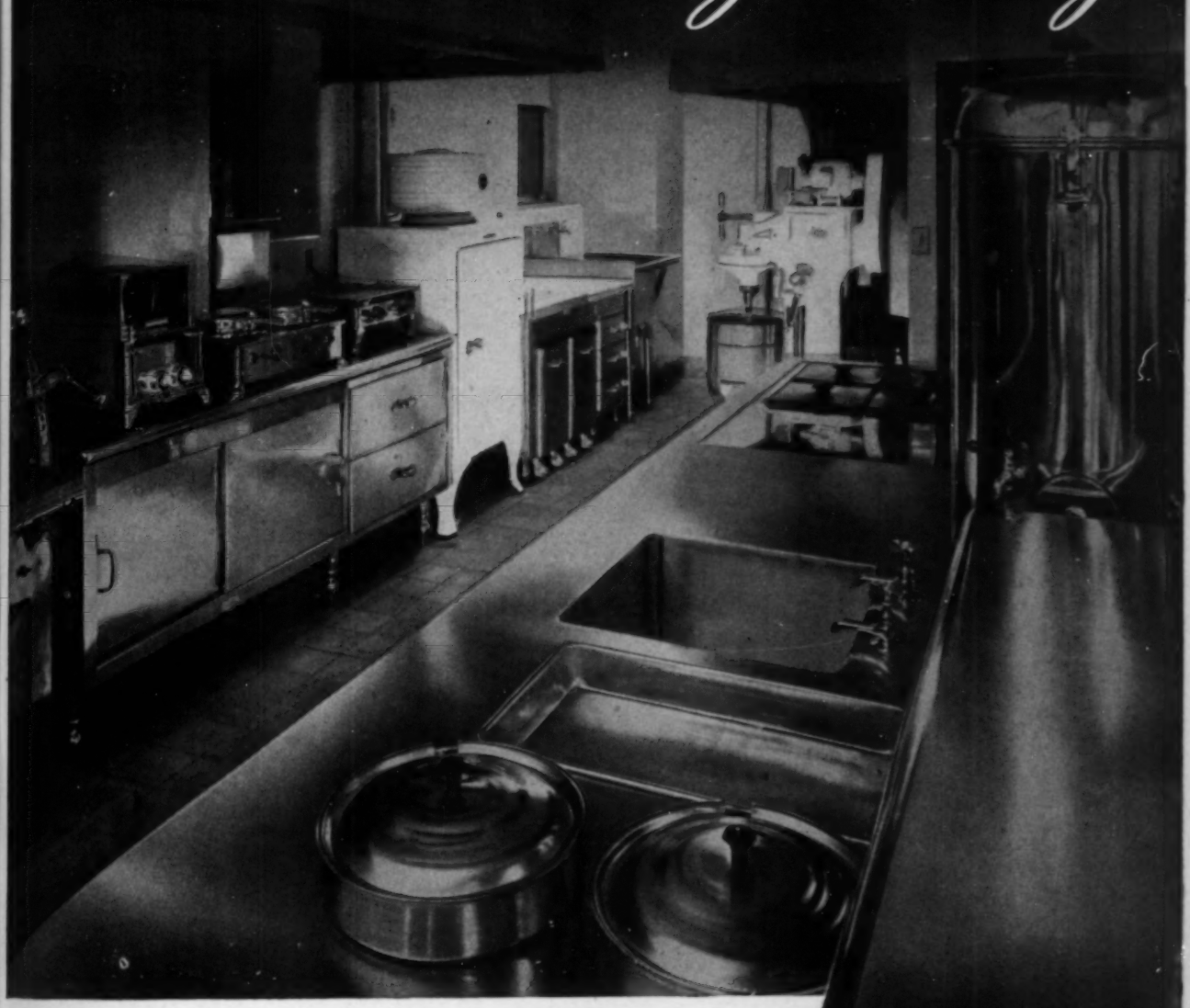
LIGHTING EXPOSITION PLANNED

A five-day lighting exposition—the "Victory Lighting Jubilee"—will be held in New York City at the 17th Regiment Armory, November 26-30.

Sponsored by General Electric's Lamp Department, the exposition will feature virtually every manner of fixture designed for commercial, industrial and residential needs. Invitations to exhibit have been sent to several hundred interior lighting fixture manufacturers and makers of portables in all parts of the country.

(Continued on page 170)

Attractive and Long Wearing



Years of service have not lessened the attractive "spick and span" appearance of the stainless steel steam tables and other equipment in this hospital staff kitchen.

Constant use has demonstrated that stainless steel not only appears clean, but is easily kept clean. The smooth, hard surface of stainless steel is resistant to rust and corrosion, and does not easily dent or scratch.

Other interesting uses of stainless steel are described in ELECTROMET REVIEW, published by ELECTRO METALLURGICAL COMPANY, the Unit of UNION CARBIDE AND CARBON CORPORATION that produces alloys for making steel. If you need this publication, send your name on your business letterhead to ELECTRO METALLURGICAL COMPANY, Room 328, 30 East 42nd Street, New York 17, N. Y.

BUY AND HOLD UNITED STATES VICTORY BONDS AND STAMPS

 (Continued from page 30)

or three pages of text there is a full page or more of practical questions.

The second volume, raised upon the solid foundation of the first, is much more technical in nature. It starts off with a discussion of specifications—their purpose, how to use them, and examples. Then follow three sets of blueprints and three examination papers referring to them. The student who follows through both volumes should be able to read blueprints.

BRITAIN'S HOUSING

Britain Faces Its Housing Emergency. Preliminary Report of National Committee on Housing Mission to Great Britain. New York 18 (512 Fifth Ave.), Natl. Com. on Housing, Inc., 1945. 8½ by 11¾ in. 27 pp. mult. 25 c.

Last summer, at the invitation of the British Ministry of Health, the National Committee on Housing sent a four-man Housing Mission headed by Mrs. Dorothy Rosenman to Great Britain to study British housing and planning. This report summarizes the mission's various findings.

The most interesting points brought out by the study probably are the approval by private builders of public housing and the British readiness to accept community controls over the use of land. The mission reports that in questioning private builders as to their attitude toward public housing not only was there no fear of competition and no antagonism toward it, but actually "unanimous agreement on the fact that the private building industry could not serve all income groups in the population and that government must build for the lowest income levels." Similarly, governmental controls in planning and redevelopment were accepted as both natural and necessary, the mission found. In the light of the Labor landslide in the last election, neither of these points of view, perhaps, can be considered surprising but they are, nonetheless, interesting.

HOME WIRING HANDBOOK

By A. Carl Bredahl. Pittsburgh, Pa., Westinghouse Electric & Mfg. Co., 1945. 5 by 7½ in. 120 pp. illus. $1.00.

A handy guide to home wiring, covering all details from electrical equipment to plan for and minimum outlets required through to circuit protection, communication systems and suggested specifications. Includes many useful tables and an appendix giving definitions, electrical symbols, and fundamental formulas.

NEW EDITIONS

AMERICAN PLANNING AND CIVIC ANNUAL: 1944

Edited by Harlean James. Washington, D. C. (901 Union Trust Bldg.), American Planning and Civic Assn., 1945. 6 by 9¼ in. xviii + 178 pp. $3.00.

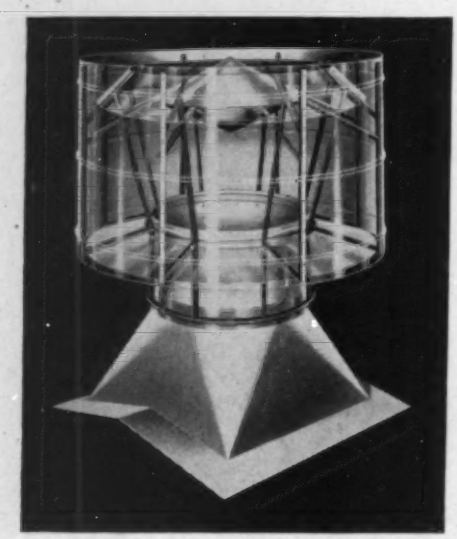
This latest A.P.C.A. annual offers a number of unusually interesting papers, among them one by Louis Bromfield on "Why Have Floods?" and another by Horace M. Albright on "Forty Years of Civic Planning." Of particular interest to architects are Thomas S. Holden's discussion of "Housing: What Private Enterprise Can Do" and Alfred Bettman's treatment of "Urban Redevelopment Legislation."

PIPING HANDBOOK

By Sabin Crocker. New York 18 (330 W. 42nd St.), McGraw-Hill Book Co., Inc., 1945. 4th ed. xv + 1376 pp. illus. $7.50.

This new edition of a familiar handbook has been enlarged to include chapters on gas piping, refrigeration piping, hydraulic power transmission

(Continued on page 168)



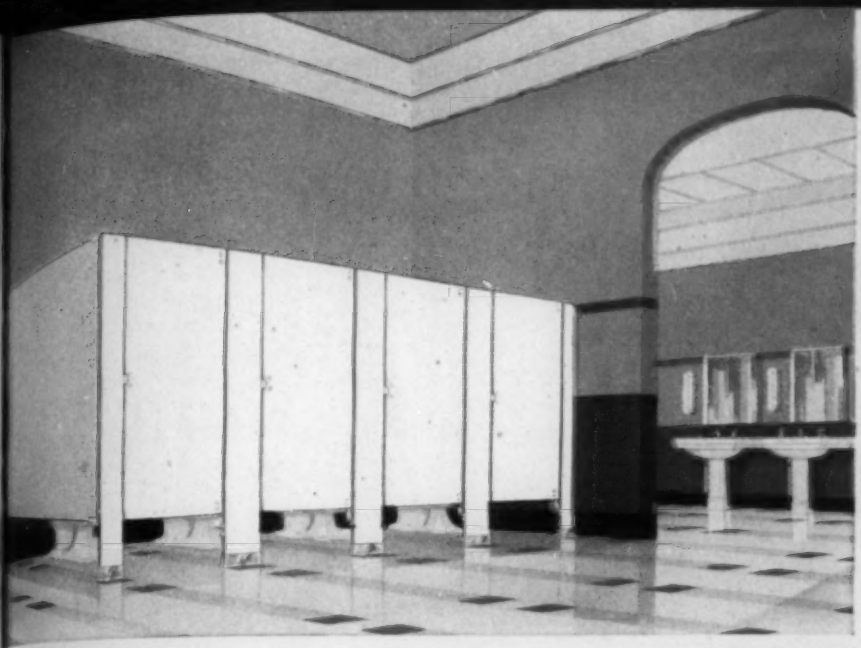
The Burt Free-Flow Gravity Ventilator can be converted into the Free-Flow Fan Ventilator by the addition of fan barrel section between head and base.

This New *Improved* BURT Free-Flow Gravity Ventilator Is a Real BUY for Your Clients

Perhaps you are already familiar with this BURT unit. The outstanding ventilator of its type since 1935, recent improvements make BURT Free-Flow—more than ever before—your first specification where gravity ventilators are indicated. Notice, in the sectional view above, that discharge is vertically upward to eliminate condensation of moisture and deterioration of roof beneath ventilator. There are no internal louvres to retard air flow and reduce capacity. New, heavier braces withstand extremely high wind velocities. Skillful BURT engineering and construction prevents back draft, provides ample drainage and storm-proofing. . . . Made in a variety of materials and sizes to match your specifications. Complete details in next issue of Sweet's—meanwhile, write for advance data sheets.

THE BURT MFG. CO.
ROOF VENTILATORS • OIL FILTERS
EXHAUST HEADS
185 So. Main St. Akron 11, Ohio

SEND FOR CATALOGS
•
Burt Engineers are glad to help on plans

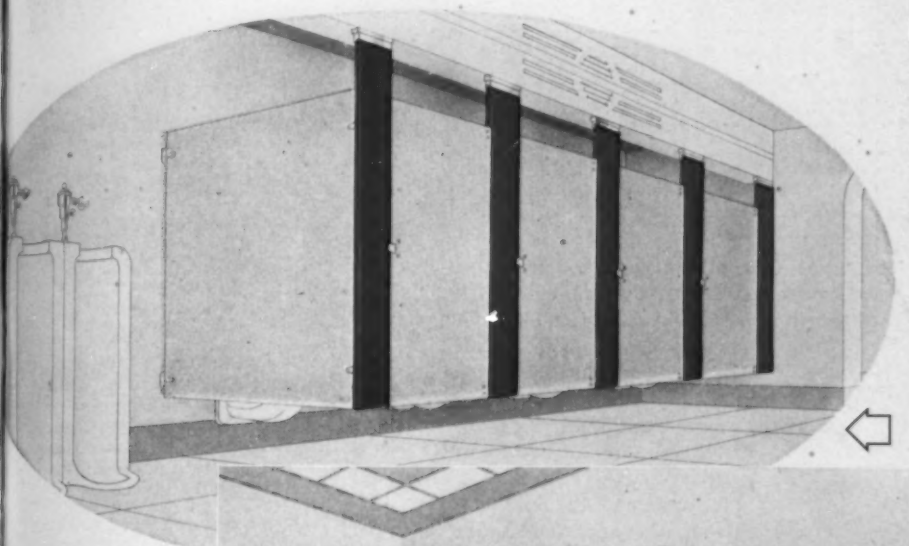


Sanymetal Normandie Type Toilet Compartments impart a moderately streamlined effect to a toilet room environment. Streamlined design wedded to utility fulfills all requirements. Unadorned utility no longer satisfies a public accustomed to bathrooms embodying varying degrees of modernity and elegance. Available in three finishes: (1) "Porcena" (porcelain on steel); (2) "Tenac" (baked-on paint enamel finish over galvanized, bonderized steel); (3) baked-on paint enamel finish over regular furniture finish, cold rolled steel. "Porcena" (porcelain on steel) is available in a variety of standard colors.

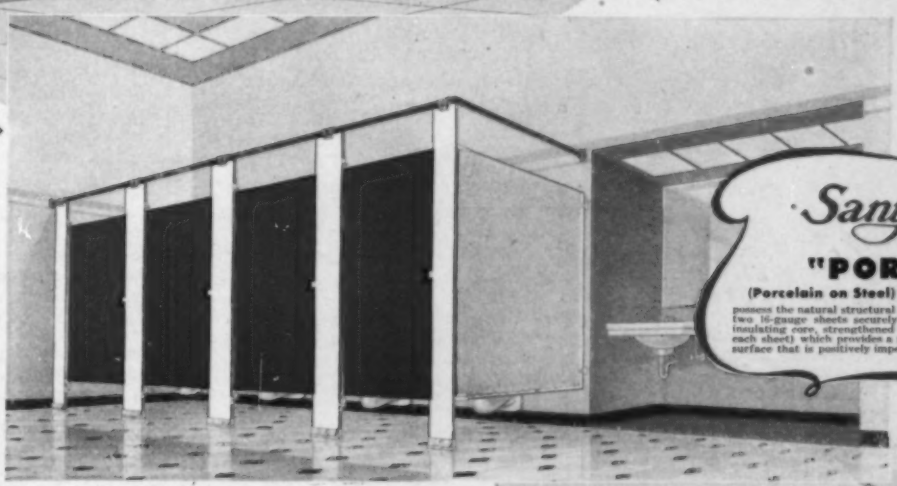
A TOILET ROOM ENVIRONMENT IS AS *important* AS OTHER ENVIRONMENTS

THE TREATMENT of a toilet room environment is no longer secondary to its utility. Blending the utility of toilet facilities with appropriate toilet room environments results in environments that are in keeping with modern interior environmental treatments. Toilet compartments usually dominate a toilet room and influence the toilet room environment. Resuming a pre-war practice, Sanymetal again offers several different types of toilet compartments for creating the most suitable toilet room environment for every type of building. Sanymetal "Porcena" Toilet Compartments will be utilized in buildings of the future because they are fabricated of the ageless and fadeless material, porcelain on steel. Sanymetal "Porcena" Toilet Compartments embody the results of over 30 years of specialized skill and experience in making over 68,000 toilet compartment installations. Ask the Sanymetal Representative in your vicinity for information about planning suitable toilet room environments. Refer to Sanymetal Catalog 19B-5 in Sweet's Architectural File for 1945, or write for file copy of Catalog 83.

THE SANYMETAL PRODUCTS COMPANY, INC.
1689 Urbana Road • Cleveland 12, Ohio



Sanymetal Century Type Ceiling Hung Toilet Compartments are particularly appropriate for schools, institutions, public buildings, office buildings, hotels, clubs, industrial plants, and theaters. They impart dignity, refinement, and cheerfulness to the toilet room environment. They make up into a rigidly fixed installation. Available in three finishes: (1) "Porcena" (porcelain on steel); (2) "Tenac" (baked-on paint enamel finish over galvanized, bonderized steel); (3) baked-on paint enamel finish over regular furniture finish, cold rolled steel.



Sanymetal Academy Type Toilet Compartments provide a certain distinctiveness. This type of partition is the only one in which all the dignity and distinctiveness of standard flush type construction, unmarred by posts, is appropriately combined with headrail. These toilet compartments are available in three finishes: (1) "Porcena" (porcelain on steel); (2) "Tenac" (baked-on paint enamel finish over galvanized, bonderized steel); (3) baked-on paint enamel finish over regular furniture finish, cold rolled steel.

Sanymetal*

"PORCENA"

(Porcelain on Steel) TOILET COMPARTMENTS

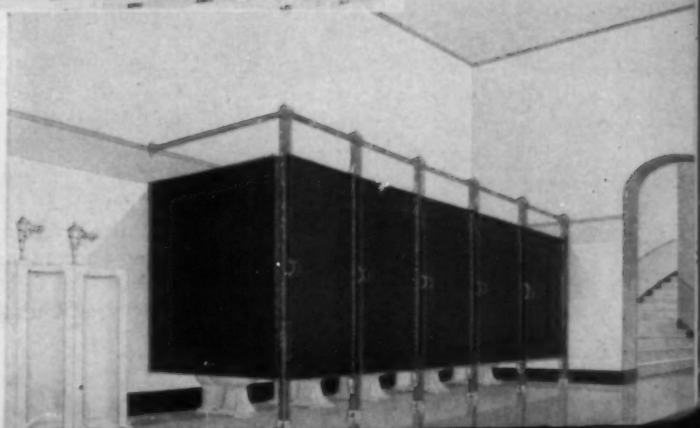
possess the natural structural strength of steel, not one sheet, but two 16-gauge sheets securely bonded on opposite sides of dense insulating core, strengthened by porcelain enamel (four layers on each sheet) which provides a non-porous, flint-hard, glass-smooth surface that is positively impervious to odors, acids and moisture.

Sanymetal*

...rade Mark Reg. U. S. Pat. Off.

TOILET COMPARTMENTS
and Office Partitions

Sanymetal Standard Flush Type Toilet Compartments: This type of toilet compartment is regarded as a standard. Sanymetal Standard Flush Type Compartments are suitable for toilets, lavatories, dressing rooms, and ward screens in all types of buildings. Sanymetal Standard Flush Type Compartments harmonize and blend well with the effects produced by materials commonly used for walls, ceilings, and floors. They are available in steel or aluminum with baked-on paint enamel finish. Also available with partition panels only in "Porcena" (porcelain on steel).



Venus Drawing Pencils are engineered to give you drafting perfection without failure: accurately *graded* to assure uniformity in all 17 degrees . . . *strong* in performance . . . *smooth* and *clean* in action.

Put VENUS to the test on *your* drawing board. Send us a postcard or a note for two free samples. *Specify* degrees wanted.

VENUS
DRAWING PENCILS
American Lead Pencil Company, Hoboken, New Jersey

REQUIRED READING

(Continued from page 166)

piping, and corrosion. Other chapters have been augmented, and the entire book has been brought up to date.

LIST OF INSPECTED ELECTRICAL EQUIPMENT

May, 1945. Chicago 11 (207 E. Ohio St.), Underwriters' Laboratories, Inc., 1945. 5¾ by 8¼ in. 424 pp.

All listings of inspected electrical equipment up to May 1, 1945.

PROCEDURE HANDBOOK

Of Arc Welding Design and Practice. Cleveland 1, Ohio, The Lincoln Electric Co., 1945. 5¾ by 8½ in. 8th ed. xii + 1282 pp. illus. $1.50 ($2.00 outside U.S.A.).

Completely revised throughout, with a great deal of new material added, including a whole new section of reference data.

PERIODICAL LITERATURE

CITIES OF AMERICA

Kansas City. By George Sessions Perry. The Saturday Evening Post (The Curtis Publishing Co., Independence Sq., Philadelphia 5, Pa.), Aug 25, 1945, pp. 14-15, 37, 39. illus.

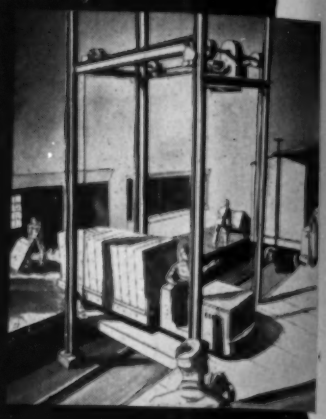
The first of a series of articles on American cities, this frank eulogy of "the crossroads of America" makes delightful reading, thanks to the deft touch of George Sessions Perry. Phrases such as "Hollywood wearing its chromium on its sleeve" and "San Antonio daubed with khaki and flushed with sun" are scattered happily through it. But of more interest to the architect than the diction, however excellent, is the gratuitous plug given J. C. Nichols for his "Country Club District," a neighborhood development housing some 50,000 people, and supplying them with shopping centers, schools, churches, etc.

SCHOOL HEATING

Heating and Ventilating of School Buildings. By Samuel R. Lewis. Heating, Piping & Air Conditioning (Keeney Publishing Co., 6 N. Michigan Ave., Chicago 2, Ill.), Sept., 1945, pp. 502-504.

With school building everywhere looming large on construction programs, this article by Samuel Lewis is, to say the least, timely. School architects will welcome it particularly because it is not limited to the advocating of a single method of heating and ventilating, but discusses the subject from the point of view of the recirculation of air now rather generally permitted, even in those states where it was once prohibited. The various systems are briefly described, their advantages and disadvantages analyzed.

For Greater Efficiency in industrial plants



MONTGOMERY "Cross-Over" BRIDGES

Montgomery "Cross-Over" Bridges make possible faster handling and speeding up of production in all plants where loading docks are separated by railway tracks. This is equally true in either new construction or modernization projects.

These Bridges replace cumbersome drawbridges and transfer cars which delay traffic flow and waste many valuable minutes in hauling operations between buildings.

It takes only a minute to lower a "Cross-Over" Bridge after a freight train leaves a dock. The Bridge can be lifted — completely out of the way — in an equally short time. Available in any desired size at moderate cost.

The "Cross-Over" Bridge is a special development by Montgomery, whose elevator equipment is providing dependable, economical service in thousands of buildings.

Montgomery manufactures a complete line of passenger and freight elevators, electric dumbwaiters and special equipment for vertical transportation.

MONTGOMERY Elevator COMPANY
HOME OFFICE • Moline, Illinois
Branch Offices and Agents in Principal Cities

...Skylights

OF ALCOA ALUMINUM ARE GOOD

He says, "From 1926 to 1941, we used approximately ¾-million pounds of aluminum in connection with our skylights . . . In every case where we recommended the use of aluminum, our customers have been highly pleased".

Here's real evidence of durability. Their aluminum skylights have been subjected to every type of exposure—extremes of weather outdoors, dampness and, often, fumes indoors. Yet not a single case of failure has ever been reported to them.

With such long life, you are spared much of the inconvenience and high cost of maintenance. Ask your supplier about skylights of Alcoa Aluminum. ALUMINUM COMPANY OF AMERICA, 2167 Gulf Bldg., Pittsburgh 19, Pa.

ALCOA FIRST IN **ALUMINUM**

ALCOA ALUMINUM

STEEL JOISTS

FOR INDUSTRIAL CONSTRUCTION

AVAILABLE NOW
for Use in Floors, Roofs, and as Roof Purlins, Steel Joint Construction is

- ECONOMICAL
- LIGHT WEIGHT
- VERSATILE
- EFFICIENT
- PERMANENT
- FIRE RESISTANT

Laclede Steel Joists and Laclede Nailer Joists for Superior Construction and Design of

- FACTORIES
- MILL BUILDINGS
- HANGARS
- THEATRES
- STORES
- CHURCHES
- APARTMENTS
- RESIDENCES

LACLEDE

Write for Catalog

LACLEDE STEEL COMPANY
GENERAL OFFICES
ARCADE BUILDING, ST. LOUIS, MISSOURI

THE RECORD REPORTS

(Continued from page 164)

TEMPORARY HOUSING SUGGESTED FOR NEW YORK

The erection of temporary houses to fill urgent housing needs in New York City has been recommended by the Citizens' Housing Council of that city. "These should be torn down after a stipulated period or when permanent housing has progressed far enough to meet the emergency," the recommendation states. "We do not favor the use of public funds for the rehabilitation of existing substandard structures for this purpose."

Other C.H.C. recommendations:

1. An expanded and accelerated program of permanent housing, both private and public. Such a program must recognize the responsibility for the relocation of families displaced from housing sites. This expanded program would include

(a) support of the Wagner-Ellender bill now before Congress which would provide additional public housing and new governmental aid for private housing;

(b) continued encouragement of insurance companies and banks to enter the field of "middle market" housing, with insistence on the improvement of standards of community planning, densities, and care of displaced families;

(c) favorable action on the referendum in November for an additional state housing subsidy of $1,250,000;

(d) appropriation by the state legislature of the remaining $80,000,000 in loan funds authorized by the constitution, and authorization of a referendum on an additional $2,750,000 of subsidy;

(e) use of city funds for purposes of subsidy of additional public housing units;

(f) the construction of special permanent relocation houses in each borough for the temporary accommodation of families displaced by new construction.

2. Continuation of rent control on existing structures until the emergency is over.

BLANDFORD SEES INDUSTRY CHALLENGE

With the lifting of all wartime controls over housing construction, says NHA Administrator John B. Blandford, Jr., the housing industry faces the challenge of gearing its operations to meeting a broad and urgent need without precedent in the history of this country.

Predicting that the housing short-

(Continued on page 172)

Get this book for A. I. A. File 14-K

"ANCHOR PROTECTIVE FENCES" is both a catalog and a specification manual. Shows many types and uses of Anchor Chain Link Fence . . . pictures installations for many prominent companies and institutions . . . contains structural diagrams and specification tables.

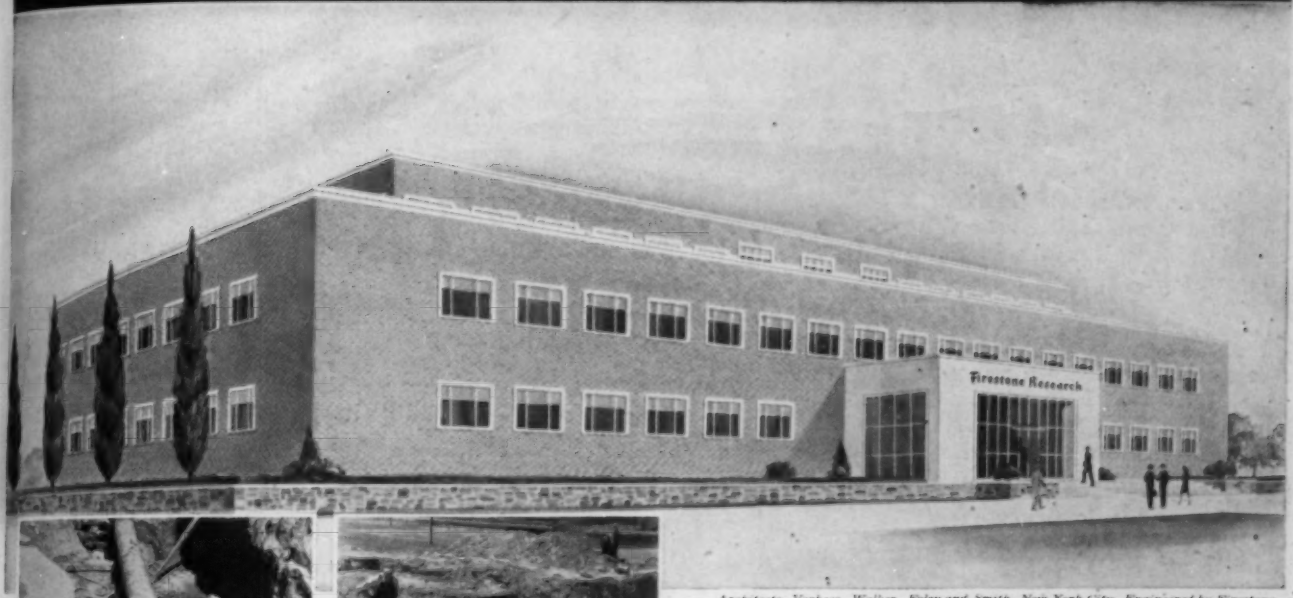
Also shows important and exclusive Anchor features: *Deep-Driven Anchors*, which hold the fence permanently erect and in line in any soil; *Square Frame Gates*, amazingly free from sagging and warping; *Square Terminal Posts* and *U-Bar Line Posts*, which increase strength and durability.

Just ask for Book No 110. You'll find it both useful and informative. We'll be glad to send a free copy. Address: Anchor Post Fence Co., 6600 Eastern Ave., Balto., 24, Md.

Anchor Fence

Nationwide Sales and Erecting Service

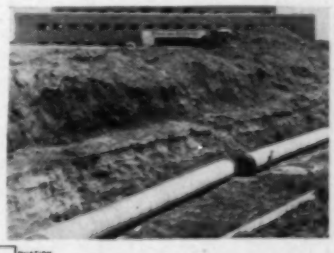
RIC-WIL STEAM CONDUIT CONNECTS NEW Firestone RESEARCH LABORATORY TO CENTRAL BOILER PLANT ONE MILE AWAY



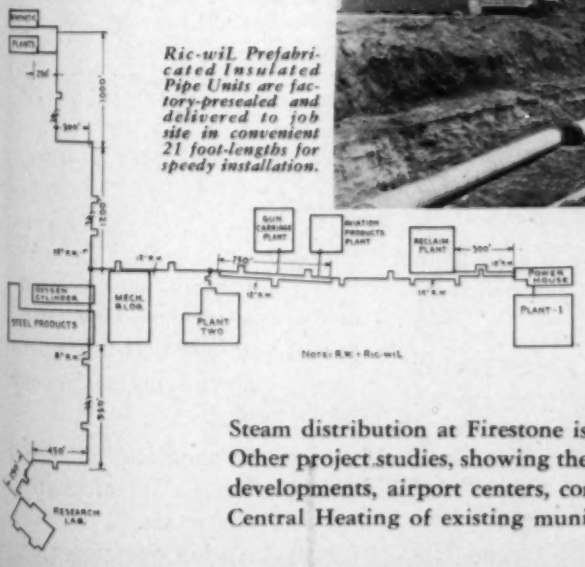
Architects, Vorhees, Walker, Foley and Smith, New York City. Engineered by Firestone.

Installing Ric-wiL Prefabricated Insulated Conduit on steam line to Firestone Laboratory. Note pipe and casing anchored at 45° offset.

Ric-wiL Prefabricated Expansion Loop "cold sprung" into position. Loops are fitted with drive couplers for easy assembly to straight runs.



Ric-wiL Prefabricated Insulated Pipe Units are factory-presealed and delivered to job site in convenient 21 foot-lengths for speedy installation.



The very latest developments in building design and services have been incorporated in the magnificent new Firestone Research laboratory. The objective was to provide the utmost in comfort for the chemists, physicists, engineers and technicians, and to supply those many services required in research work.

After an exhaustive study, it was determined that instead of a boiler plant at the site, it would be more practical to extend a steam line from the nearest factory building 2100 feet away, and thus obtain heat and power from the main power plant over a mile to the north. Steam is delivered to the laboratory in 8" Ric-wiL Prefabricated Insulated Pipe, at 180 P.S.I.

Every building in the vast Firestone Akron industrial community obtains its steam from one central plant. Schematic plot plan at left shows distribution lines—practically all of which are now in Ric-wiL Prefabricated Insulated Pipe Conduit.

Steam distribution at Firestone is described in detail in a booklet now in preparation. Other project studies, showing the application of Central Heating to community housing developments, airport centers, commercial groups, shopping centers and conversion to Central Heating of existing municipalities or neighborhoods, are available on request.

RIC-WIL INSULATED PIPE CONDUIT SYSTEMS
THE RIC-WIL COMPANY · CLEVELAND, OHIO
AGENTS IN PRINCIPAL CITIES